V3 A CYCLOPEDIA OF EDUCATION

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A
CYCLOPEDIA OF EDUCATION

EDITED BY

PAUL MONROE, Ph.D.

PROFESSOR OF THE HISTORY OF EDUCATION, TEACHERS COLLEGE
COLUMBIA UNIVERSITY

WITH THE ASSISTANCE OF DEPARTMENTAL EDITORS
AND
MORE THAN ONE THOUSAND INDIVIDUAL CONTRIBUTORS

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A CYCLOPEDIA OF EDUCATION

GAILHARD, JOHN. — Writer of the *Compleat Gentleman*, 1678. This treatise is divided into two parts, the first containing directions for the education of youth, in their breeding at home, and the second concerns itself with their breeding in traveling abroad. Gailhard seems to have spent a number of years as tutor abroad to "several of the nobility and gentry." In the first part, he treats of breeding children at home, and recommends a wide curriculum similar to that of Milton. Throughout the stress is laid upon the bearing and breeding and character which should be shown by the nobleman and the best means of inducing it.

In the next part, Gailhard points out the qualifications, duties, and value of the traveling tutor, and his treatise is probably the most complete on the subject. Before traveling, the pupil should learn something of the language of the country to which he goes. He should, too, know well his own country and its main characteristics before traveling. The pupil, following the excellent custom noted by Bacon, is to "take pains in writing in his Diary Book" all he sees. Religious devotions and reading of the Bible must not be neglected. Physical exercises and music must also receive attention. If he comes to a convenient place, he should learn the general principles of physic, say at Padua or Montpellier, and Civil Law, say at Angers or Orleans. Drawing should also be learned. Gailhard suggests three years as the time for the Grand Tour, of which half should be spent in France. On the whole, Gailhard's book gives great insight into the tone and standards of the young gentleman of the times and the current English views of foreign nations. F. W.

See Gentry and Nobles, Education of.

GALE, GEORGE WASHINGTON (1789–1863). — A pioneer in the movement for manual training in the United States, was graduated from Union College in 1814 and from the Princeton Theological Seminary in 1818. He was for several years engaged in the work of the ministry; but, failing in health, he retired to a farm at Whitesboro, N.Y., where he gave a class of boys free board and tuition for a few hours of work each day on the farm. Out of the experiment grew the Oneida Manual Labor Institute of which he was principal for seven years (1827–1834). Courses were given in applied agriculture and woodwork. He was one of the founders of Knox College at Galesburg, Ill., and for a few years a professor there. W. S. M.

See Industrial Education; Manual Training Schools.

GALE COLLEGE, GALESBURG, WIS. — See Lutheran Educational System in the U. S.

GALEN, CLAUDIUS (131–*c.* 201). — Greek physician and writer on medical subjects. He was born at Pergamon in the reign of Hadrian. Galen studied medicine at Pergamon, Smyrna, and Alexandria. On completing his studies he returned to his native city where he was appointed physician to the athletes in the gymnasia. He spent a few years at Rome, where his ability attracted attention. In 169 he was summoned to attend the Emperors Marcus Aurelius and L. Verus in the campaign on the northeastern frontier. He returned to Rome, where he became for a time physician to Aurelius and Commodus. The exact date of his death is not known, but Galen certainly lived in the reign of Septimus Severus.

Galen was a prolific writer and is credited with some 500 works. Of the extant works about 118 are considered to be genuine. Although known mainly by his medical works, he wrote many treatises on philosophy and literary criticism. Among his writings are commentaries on the dogmas of Plato and on the *Timœus*. His interest in the works of Hippocrates is shown by the commentaries. He also wrote on the Ancient Comedy, on Atticisms, and on style. But his fame rests on his works in the field of medicine. He touched on every aspect of the subject, including anatomy and physiology, dietetics and hygiene, pathology, diagnosis, pharmacy, and materia medica, therapeutics, and surgery. He treats of the anatomical phase most successfully, although it is not thought that he had any opportunities for dissecting human bodies. He himself recommended the dissection of animals, and especially monkeys, as being most like the human being. He is reputed to have performed some remarkable surgical operations. In the field of pharmacy and materia medica he seems to have had more faith in amulets than in medicine, although he was famous for certain prescriptions. Galen was the first and greatest authority on the pulse.

Galen's works held the place in the study of medicine in the medieval universities which Aristotle held in philosophy. His authority was not questioned until the sixteenth century. In 1559 a Dr. Geyner was admitted to the College of Physicians of England only on recanting his attacks on the infallibility of Galen. But from the time of Galen all sects (*e.g.* Dogmatics, Empirics, Eclectics, Pneumatics, and Episynthetics) were united under the one great source of medical lore. His works were for a long time read in Latin or Arabic translations. The first edition of the Greek text was published by the Aldine press in 1525.

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GALILEI, GALILEO (1564–1642). — The famous astronomer was born at Pisa. His father, who was skilled in music and mathematics, intended the son for trade, but was prevailed upon to send him to the University of Pisa to study medicine. Galileo was of such an argumentative disposition that he won for himself the nickname of " the wrangler." But his bent was not for medicine. In 1582 he made his first scientific discovery of the principle of oscillation of a pendulum and invented an instrument which was useful to doctors in testing the beat of the pulse. Through poverty he was compelled to leave the University without a degree in 1585. In 1586 he wrote an essay, not published until the last century, on the hydrostatic balance, an instrument which he had invented to measure the specific gravity of solids. In 1589 he became professor of mathematics and astronomy in the University of Pisa. At this period began his long series of experiments which mark the beginning of modern methods in scientific study. In place of deductions and reliance on the authority of Aristotle he made actual experiments as precise as they could be in his time. He devoted his attention to a study of falling bodies, and concluded, contrary to the opinion of the day, that the time taken by falling bodies depended not on their weight, but on the resistance of the air. Although the appointment at Pisa was for three years, he left before his time expired, owing to the attacks of his opponents. In 1592, he was appointed professor of mathematics at Padua, originally for a period of six years, later gradually extended to eighteen years, and then for life. Here he attracted large audiences to his lectures, and devoted his attention to mechanics and the invention of scientific instruments. His first discovery of importance in astronomy was made in 1604 when he noticed the appearance of a star in the constellation Serpentarius which was more distant than the planets. From this period on Galileo's reputation was spread over Europe by his telescopic observations, and his improvements on the telescope. His discoveries he published in 1610 in *Sidereus Nuncius* (*Sidereal Messenger*). Here he showed that the markings on the moon were caused by mountains and their shadows, that the moon was much like the earth, and that celestial phenomena were similar to those on the earth. The Pleiades and the Milky Way he proved to consist of numerous stars invisible to the naked eye. In the same year he discovered the Satellites of Jupiter. Feeling the need of more time for his researches and writing, he returned to Pisa, where he was appointed professor of mathematics and first philosopher and mathematician to the Grand Duke of Tuscany, a well-salaried post with few duties attached. Among his other discoveries were the sun spots and the fact that Venus derived light from another body in the same way as the moon.

There were not wanting those who seized an opportunity of assailing Galileo for his overthrow of the belief in the celestial bodies as perfect and unchangeable. He was drawn into a dispute on the question of the validity of reasoning and observation on the one hand, and scriptural and ecclesiastical authority on the other. His attitude is illustrated by the following quotation from his writings, " Methinks, that in the discussion of natural problems we ought not to begin at the authority of places of scripture; but at sensible experiments and necessary demonstrations." In 1615 he was denounced to the Inquisition which appointed a body of theologians to examine the Copernican doctrines; as a result Galileo was admonished by order of the Pope to abandon his opinions. For the next few years Galileo remained in Rome, where he had powerful friends. In 1623 he wrote *Il Saggiatore* (*The Assayer*), the final contribution to a controversy on which he had entered with a Jesuit in 1618. The book again brought him into favor with the Pope, to whom it was dedicated. In 1632, after considerable difficulties with the censors at Rome and Florence, he published a Dialogue on the *Two Chief Systems of the World, the Ptolemaic and Copernican*, which was a powerful argument in support of the Copernican theory set out in a thinly veiled disguise. A feeling that the book treated disparagingly of the Pope caused the Inquisition to stop the sale of the book and to compel Galileo to appear for trial. He was treated kindly during the trial, but was condemned to prison. Through the influence of his friends he was allowed to remain in confinement in a country house near Florence. He continued his investigations, which, however, were cut short by blindness in 1636. The chief work of this period was *Mathematical Discourses and Demonstrations concerning Two New Sciences, relating to Mechanics and to Local Motion,* written in the form of a dialogue and dealing with statics, falling bodies, and projectiles. In 1642 Galileo died and was buried in the Cathedral of Santa Croce. Galileo ranks with Bacon as one of the founders of modern experimental science. In astronomy he will always have a permanent place, for many of his discoveries, despite the lack of exact instruments, were remarkable for their precision. In dynamics he created an entirely new science which served as a basis on which future scientists were to build.

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GALL, FRANZ JOSEPH (1758–1828). — The founder of phrenology (*q.v.*), born at Tiefenbrunn in Baden, the son of an Italian merchant named Gallo. He received his early education at the hands of his uncle, a Catholic priest; later studied at Baden, at Bruchsal, at Strassburg, where he distinguished himself by research in natural history, and at Vienna, where he took his doctoral degree and commenced the practice of medicine. In 1796 he began to promulgate his theory in lectures, which were continued until 1802, when they were forbidden by the Austrian government as inimical to religion. In 1805 he left Vienna, in company with his pupil Spurzheim, and in 1807 established himself at Paris. In the intervening two years he lectured in the principal cities of northern and central Europe, and in 1823 delivered a few lectures in London. He continued lecturing at Paris until a few months before his death, which occurred at Montrouge.

The observations on which Gall based phrenology began during his boyhood, with the noticing of an apparent relation between the size of the eye and the retentiveness of memory. At Strassburg and Vienna Gall was indefatigable in the examination of the heads of persons who exhibited striking mental peculiarities, modeling many of them in plaster and wax; and extended his study to the lower animals. He was practically the first to recognize the main features of the gross anatomy of the brain, and the function of the fibers and of the cortex. The importance of his work is indicated by one of the inscriptions on a medal struck in his honor in Berlin: *Il trouva l'instrumente de l'âme.* Gall's most important publications were the *Recherches sur le système nerveux en général et sur celui du cerveau en particulier,* written in collaboration with Spurzheim (*q.v.*), and published in 1809; and the *Anatomie et physiologie du système nerveux,* which appeared in four volumes in 1810–1819. The latter work was commenced with Spurzheim, but finished alone, the two having quarreled and separated. An abridged edition was published by Gall in 1822, and an English translation appeared in Boston in 1835. K. D.

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GALLAUDET, THOMAS HOPKINS (1787–1851). — The founder of the first American school for the deaf, born in Philadelphia the 10th of December, 1787. He received his education at the Hartford Grammar School, Yale College (graduating in 1805), and Andover Theological Seminary. Becoming interested in the deaf, and recognizing their need of education, he went to England to study the methods of lip-reading and articulation in use in that country. The selfishness of the proprietors of the British schools made it impossible for him to study the methods there used, and he went to Paris, where he was cordially received by the Abbé Sicard (*q.v.*), who placed all the facilities of the French institution at his disposal. The manual or sign method was employed in the Paris school, and this was the method that Gallaudet brought to America. With the assistance of Laurent Clerc, who had been associated with the Abbé Sicard, Gallaudet organized the American Asylum for Deaf-mutes at Hartford, in 1816, and continued at its head until 1830. As this was the first school for the deaf in the United States, practically all the instructors in deaf schools in the country for a half century were trained at Hartford, and the manual or sign alphabet became the dominant method of instruction. During 1832 and 1833 Gallaudet was professor of the philosophy of education in New York University. This was the first professorship of education in the United States. (See Education, Academic Study of.) He was also active in the movement which established the first normal schools in America. Besides his writings on the education of the deaf, he published a number of essays on the philosophy of education and several text-books, including the popular *Mother's Primer* and the *Child's Picture Defining and Reading Book.* His *Plan of a Seminary for the Education of Instructors of Youth* (Boston, 1825) gave rise to the normal school idea in America. He died at Hartford the 9th of September, 1851. W. S. M.

See Deaf, Education of the.

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GALLAUDET COLLEGE, WASHINGTON, D.C. — A coeducational institution for the higher education of the deaf, founded in 1864 as the National Deaf-Mute College. The present name was adopted at the request of the alumni in 1894 in honor of Thomas Hopkins Gallaudet (*q.v.*). The course given by the college extends over five years, including one year of preparatory work. A general course in the essentials of a liberal education is given leading to the degrees of B.A. and B.S. A normal course is maintained for training hearing persons who are already graduates of colleges and wish to become teachers of the deaf. There are fourteen members on the faculty.

GALLOWAY, SAMUEL (1811–1872). — A pioneer of the common school movement in Ohio; was graduated at Miami University in 1833. He was teacher and principal of schools in Ohio, state superintendent of public instruction (1844–1851), and professor in Miami University. He was one of the organizers and the first president of the Ohio State Teachers' Association. W. S. M.

GALLOWAY COLLEGE, SEARCY, ARK. — An institution for the education of women under the auspices of the Methodist Episcopal Church, South, established in 1890. Preparatory, collegiate, and music courses are offered. Twelve units are required for entrance to the college course which leads to the A.B. degree. There are nineteen teachers on the faculty.

GALTON, FRANCIS (1822–1911). — A celebrated English scientific investigator, born in Birmingham, England, in 1822, of a distinguished family. His paternal grandfather, a Quaker and a business man of ability, was interested in the study of birds and in statistics. A cousin, Sir Douglas Galton, was an eminent engineer. This mathematical inheritance was supplemented on the mother's side by genius in the study of nature. Galton's maternal grandfather was Erasmus Darwin, hardly less remarkable a naturalist than his illustrious grandson, Charles Darwin. Galton studied at Trinity College, Cambridge, and took the degree of B.A. in 1844. He began his career as an explorer of the upper Nile, and later of Damaraland in Southwest Africa. In the latter region he discovered the Ovampo race, an agricultural people. As an explorer he not only added materially to anthropology, etc., but also to the methods by which expeditions can most successfully be carried on. His results were published in the Royal Geographical Society's Journal for 1852, and in his books, *Narrative of an Explorer in Tropical South Africa,* and *Art of Travel or Shifts and Contrivances in Wild Countries.*

The second phase of Galton's activity concerns meteorology. He invented the graphic method of indicating weather conditions, which is to-day used in connection with weather forecasts. It appears in his *Meteorographica, or Methods of Mapping the Weather,* published in 1863. He also developed the theory of anti-cyclones especially valuable in such prognostications. In addition he invented many instruments useful in meteorologic observations. The phenomena of meteorology are so complicated that predictions can be made only in terms of probability and on the basis of extensive statistical data. These methods, Galton conceived, should be applied to biology, anthropology, and psychology, for here, too, the conditions are exceedingly complicated, and statistical methods and probabilities are an appropriate foundation and form of expression for predictions. His work in these fields constitutes the third phase of Galton's activity. He began with the study of heredity, and in 1869 published his *Hereditary Genius,* in which he demonstrated the inheritance of genius. A child whose ancestors are talented is shown to have a much greater chance of being well endowed than one not possessing such an heredity. He continued his studies of eminent men in his *English Men of Science,* published in 1874. Later he took up the investigation of the nature of mental powers, and to get material, devised the method of the *questionnaire.* He used this method especially in the study of mental imagery, in which his researches, published in 1883 in *Inquiries into Human Faculty,* are classic. The method of the *questionnaire* also gave him his data in regard to family faculties, by which he was enabled to make a careful quantitative study of the types and amount of inheritance. In these studies, published in 1889 in *Natural Inheritance,* he developed an ingenious method of using the probable chance distribution of variable factors as a basis for estimating the likelihood of the presence of any chance tendency disturbing such a distribution. He also laid the foundation for his *Law of Ancestral Inheritance* (see Heredity), which he stated in a paper presented before the Royal Society. In connection with these anthropological and psychological researches he invented composite photography, as a means of bringing out the typical facial characteristics of a group. He also discovered the unique character of the arrangement of the lines on the fingers of any individual, and his works on *Finger Prints* and an *Index of Finger Prints* formed the basis of the Bertillon system of identifying criminals. The latest work of Galton concerns eugenics (*q.v.*), by which he meant the science of controlling mating in the interest of the preservation and improvement of the type. This practical application of his studies in heredity has an immediate relation to education, since it is upon this agency that the principles of eugenics must in the main depend in order to reach the individual and affect practice. It is likely, however, that the greatest service rendered by Galton to education consists in the statistical methods by which quantitative accuracy can be introduced into the complicated phenomena of mental culture. Only thus can educational theory and practice be given the convincing character of science. Galton died on Jan. 17, 1911.

E. N. H.

See Error of Observation; Genius; Graphic Curve; Heredity.

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GALTON'S LAW. — See Heredity.

GALWAY, UNIVERSITY COLLEGE. — See Ireland, Education in.

GAMALIEL. — Grandson of Hillel, and the founder and head of the liberal school which bore that name, was one of the most distinguished of Jewish scholars and educators. In such high respect was he held that at his death, according to the Mishna, " reverence for the law ceased and purity and abstinence died away," such was their sense of loss in the death of their greatest bulwark of learning and morality. Under his influence instruction in the Jewish law was more fully imbued with the spirit of practical life than in later times. He was an enthusiastic student of Greek literature, which was held in abhorrence by the rabbis and forbidden to the young. His influence appears in the training of St. Paul, who prided himself upon having sat at the feet of this greatest of Jewish teachers. His enlightenment and toleration are apparent in his verdict as President of the Sanhedrin of Jerusalem in the trial of St. Peter and other Apostles (Acts v, 33–42). The tradition that Gamaliel became a Christian and was baptized by St. Paul is inconsistent with the honors afterwards heaped upon him by the Jews. W. R.

See Jewish Education.

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GAMES. — A game is a form of play in which the players adhere more or less strictly to certain traditions, regulations, or rules, written or unwritten. Games are a later development of play (*q.v.*). Phylogenetically and ontogenetically informal play precedes formal play or games.

Origin. — The origin of most existing games is obscure. Falkener has traced some to certain rites of divination, and Culin also asserts that games were derived from serious religious ceremonies. Even as late as the Olympic games of Greece and the Ludi Apollinares at Rome athletic games had a religious significance. Nearly all our existing games are modified forms of games of great antiquity. Culin says, " It is safe to say that no new game has been invented during the historic period, and that all we regard as new are only modifications of games played before the building of the Egyptian pyramids." " Among the pictures of ancient Egyptian games on the tombs of Beni Hassan " (3000–2500 B.C.), says E. B. Taylor, " one shows a player with head down so that he cannot see what the others are doing with their clenched fists above his back." This game is played by boys to-day. It is the American game sometimes called " Biff," the English game of " Hot Cockles," the French game of " Main-Chaude," and the Greek " Kollabismos." Taylor calls attention to Luke 22: 64: " And they blindfolded him and asked him saying, Prophesy: who is he that struck thee? " Among the games of the American Indians are found the prototypes of dice, cards, chess, golf, shinney, baseball, and racket.

Games, like informal play, doubtless grew out of experience. Among the first games of children are games of chasing, throwing, and striking. These suggest the hunting and fighting experiences of the race. A. B. Gomme in her notable study of the games of children has classified games according to the experience represented, as contest games, marriage games, funeral games, harvest games, divination games, etc. Many folk dances especially suggest experience. Among the Indians, dances represent scenes of the hunt or the warpath. Among civilized people, many folk dances represent industrial experiences, as in the harvest and weaving dances.

Practical Uses of Games. — The uses of games may be divided as follows:

A. Fundamental
  (1) For conservation
  (2) For development
  (3) For education
    (*a*) Physical
    (*b*) Mental
    (*c*) Moral
    (*d*) Social

B. Incidental
  (1) Recreational
  (2) Substitutional
  (3) Prophylactic
  (4) Cathartic
  (5) Corrective
  (6) Vicarious

Conservation. — It is the office of games to conserve certain essential characteristics, certain fundamental interests and powers. It is a principle in evolution that when an organ develops from a lower to a higher form there is a tendency toward a loss of some excellence formerly possessed. In any period of rapid evolution there is always a danger that the passing of the old may be too rapid or too complete, that the foundation may be sacrificed to the superstructure, that the fundamental may be depleted in the acquisition of the accessory. It is of great importance in the evolution of a species that right proportions be maintained between that which was the old and that which is the new. This danger that is present in the development of a species is increased in the case of the recapitulatory process in the individual, a fact of tremendous importance in education.

Now James has shown that many essential hereditary characteristics are conserved by means of instincts. That is, what is really inherited in such cases is only a potentiality or tendency, and the survival of the characteristic, or power, depends upon habits formed through instinctive reaction to the environment. But many instincts ripen at a certain age, and then weaken or disappear. If a habit has been formed meantime, well and good; if not, it is likely never to be formed.

It is well understood that there is a progression of games in childhood and youth corresponding to the progression of interests and powers through the various periods of growth and development. These various games call out, exercise, and develop certain fundamental physical, mental, moral, and social traits of peculiar interest at the several periods. If no adequate opportunity be provided for the kind of play necessary to call out, exercise, and develop these traits at the time of keenest natural interest in them, these interests tend to fade away, as is the case of the instincts mentioned by James, and the most favorable opportunity for forming habits of reaction in accord with these is lost. " If," says James, " a boy grows up alone at the age of games and sports, and learns neither to play ball, nor row, nor sail, nor ride, nor skate, nor fish, nor shoot, probably he will be sedentary to the end of his days; and, though the best of opportunities be afforded him for learning these things later, it is a hundred to one but he will pass them by and shrink back from the effort of taking those necessary first steps, the prospect of which at an earlier stage would have filled him with eager delight." So, on the moral side, if a boy grows up alone and does not learn to play games which call for great activity, competition, courage, fortitude, perseverance fairness, generosity, loyalty, coöperation, sacrifice, he loses the most favorable opportunity for the development of these traits in him. While it is possible to conceive that work might at a favorable time provide opportunity for the exercise of these traits, yet work, in so far as it departs from play, in the psychological sense, must in the nature of the case by so much be educationally less effective.

Development. — The normal development of an organ depends upon three factors: (1) natural impulse to growth, or heredity; (2) nutrition; (3) exercise. According to Tyler, there seem to be three stages of development. (1) A period of growth in which there is little or no exercise of the organ. (2) A period in which growth continues and modification of internal structure, under the stimulus of exercise, begins. (3) A period after growth in size and weight has been attained, in which exercise and structural change continue, as the organ approaches maturity. When we consider that the game interests have their genesis in structure which at its various stages of development calls for exercise appropriate to its needs and powers, it necessarily follows that the kind of exercise supplied by the games must in turn greatly stimulate growth and development. Moreover, the emotional accompaniment of joyous participation in games and the effect upon the vaso-motor system tend to bring about a condition of full nutrition of the developing organs. This explains the exhilaration which accompanies participation in games like baseball and tennis, for example. In short, appropriate games provide the exercise which is suited to the present needs and powers of the developing organs, the exercise which best stimulates growth and structural change, and which also stimulates the vaso-motor system and tends to bring about a condition of full nutrition.

Education. — *Physical.* — The value of games in physical education is obvious. Moreover, it is interesting to note that games have been the conservative and not the radical element in systems of physical training. Of the great systems of the world, the Grecian, the medieval, the British, the German system of Guts Muths and Jahn, and the Swedish system of Ling, the exercises of the first three were largely or wholly games, there was a large element of games in the fourth, and there is especially in America a constantly increasing element of games in the last. It is now very generally recognized that specific movements designed for the development of particular muscles or groups of muscles and performed while consciousness is largely absorbed in the execution of the movements, are not, from the standpoint of health and vitality, as beneficial as the exercises involved in games, in which there is a far larger element of pleasure and little or no consciousness of the details of the movements executed.

Mental. — Recent studies of the relation of motor ability to intelligence have emphasized the educational value of play activities. Mosso and others have shown that the phenomena of muscular fatigue and mental fatigue are identical. Fatigue of the muscles is attended by a loss of power of attention, and fatigue of attention by loss of power of the muscles.

Educationally, games develop power rather than extend intelligence, that is, develop an ability to apply what one knows rather than give comprehensive knowledge which may or may not be applied. Educationally games excel in this, that they develop a capacity for instantaneous and perfectly coördinated reaction to situations within the field in which the education applies, however restricted that field may seem to be. In emergencies, crises, in time of stress, excitement, or peril, within the field of action analogous to that covered by games, games provide a training *par excellence.* For example, games may furnish no definite knowledge that would enable a lawyer to conduct a case successfully, but they do provide a training which would enable a lawyer, under the strain of an exciting trial, in full possession of himself, to concentrate and coördinate every power to the task in hand.

Moral. — The relation of games to moral training has always been recognized to a certain extent. However, a far greater appreciation of the moral significance of games has come about in recent years, through the stimulus of a new appreciation of the meaning and significance of play in general, and notably by such a study as Gulick's *Psychological, Pedagogical and Religious Aspects of Group Games.* The generally accepted theory that evolutionary progress has been from the fundamental to the accessory and that this same order, in a general way, is observed in the normal development of an individual, has as apt an application in the field of conduct as in physical or intellectual development. One readily recognizes that there are certain fundamental virtues which are the basis of later accessory moral qualities. Now, the significance of games in moral training lies not alone in the opportunity for the exercise of fairness, courage, coöperation, etc., but especially in the fact that children and youth have, at a certain age, an instinctive interest in just these fundamental virtues. Just as the developing organs call for physical exercise of a type appropriate to their needs and powers, so also the moral nature or organism calls for a display of certain types of character appropriate to the stage of development. For example, the individual competitive games of boys from ten to twelve call for such traits as courage, hardihood, pugnacity, fairness. The boy who displays these qualities is admired by his companions, and the boy who lacks them is not. But physical courage is a prototype of moral courage, hardihood of fortitude, pugnacity of righteous wrath, fairness of justice.

Social. — A game is socialized play. Games necessitate an appreciation of social relationships, and there were no games until the race had developed a capacity for social activities. Since games developed commensurately with the capacity of the race for social activity, there is in games a review of the social development of mankind.

There are several obvious applications of the social influence of games, as for example:—

1. In the development of sociability and sympathy.
2. In the training and control of the fighting instinct, or the instinct of competition, as a basis of noble emulation on the one hand and of capacity for righteous conquest on the other.
3. In the training for coöperative action.
4. In providing an outlet for types of activity that might otherwise become anti-social.

Games might be classified according to social significance, in three classes:—

1. Sociable or coöperative games, such as the dramatic and imitative games of children, folk games, dances, group singing.
2. Competitive games, such as wrestling, boxing, racing.
3. Coöperative-competitive games, such as baseball, football, basketball.

The emphasis of interest in these games is somewhat as follows: In sociable or coöperative games, to about seven (possibly, in the case of girls, at all periods); in competitive games from about seven to about twelve; in coöperative-competitive games, from about twelve on.

Incidental uses of games. — *Recreational.* — Since games have the uses mentioned under Conservation, Development, and Education, they are, for children and youth at least, to be regarded as having a far deeper significance than the merely recreational; yet the recreational effect of games as a change from study and sedentary pursuits and its value are obvious.

Substitutional. — Games provide a useful substitute for what might prove harmful activities. They also divert from undesirable states of consciousness, as in disappointment, anger, morbid introspection and the like. " Horse play," orgies, outbreaks, might often be diverted through the legitimate channel of games.

Prophylactic. — Games often prevent anti-social activities and the acquisition of anti-social habits. Boys are arrested for misdemeanors in throwing, stoning windows, snowballing pedestrians, provoking persons, even policemen, to chase them, etc. Ball games and running games provide the same activity and excitement in a legitimate form.

Cathartic. — Aristotle thought that certain primitive instincts could be purged away by harmless means, as by the drama, and in this way harmful and anti-social expression of the impulse be prevented. Strictly, games should not be regarded as cathartic so much as directive. Games serve not so much by purging away as by training and directing the primitive instincts. For example, boxing under right conditions diminishes fighting, not, however, by purging away the fighting instinct, but by directing and controlling it, making it a basis for a higher expression in games and in

SUMMARY OF ACTIVE PLAYS AND GAMES MOST BENEFICIAL AT DIFFERENT AGES

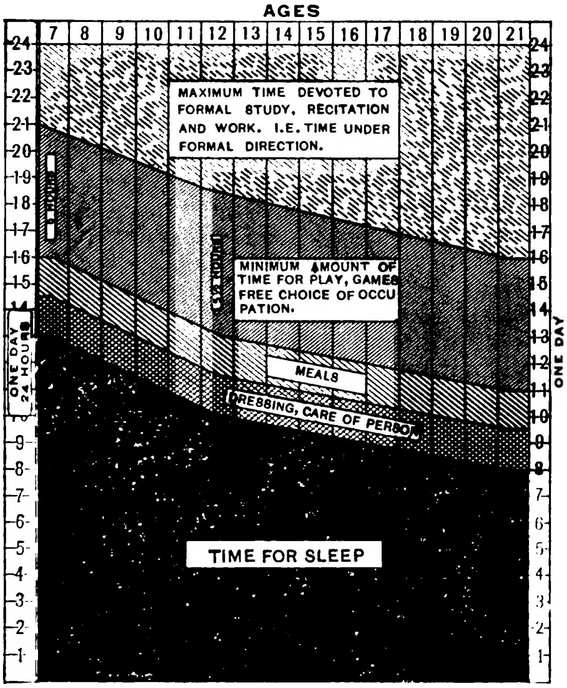
Adapted from Dr. F. A. Schmidt's Chart of Physical Exercises by G. E. Johnson

	Age	Special Physiological Character	Characteristic Change in Nervous System	Prevailing Need of Exercise	Special Moral and Social Significance	Free Play. Experimentation of bodily movements and of the senses	Dramatic and Imitative Games	Rhythmic Movement Folk games. Dances	Simple Games of Movement. Tag and Running Games. Competition	Coöperative-competitive Games. Especially Ball Games	Trial of Skill on Apparatus. Jumping Throwing	Exercises of Quickness, especially races according to time and distance. Skating, Skiing	Trial of Strength on Apparatus
Sociable Period	0-3	Rapid growth in height and weight	Development of the senses Rapid growth of brain and nervous system	Getting control of large bodily movements Plenty of open air life Stimulation of breathing, of circulation, and therefore of metabolism and blood formation	Sympathy and Sociability	▨	▨	▨					
	3-6	Greatest liability to contagious diseases	Perfection of the senses Continuation of rapid brain growth	Perfecting control of large bodily movements Plenty of open air life Stimulation of breathing, of circulation and therefore of metabolism and blood formation		▨	▨	▨	▨				
Competitive Period	6-9	Getting accustomed to the sitting position in school. Less growth in height Disturbance in the formation of blood easily occurring	Close of rapid brain growth; transition from emphasis on growth to emphasis on structural change	Plenty of open air life Stimulation of breathing, of circulation and therefore of metabolism and blood formation	Measuring self in terms of mates Self-assertion Competition	▨	▨	▨	▨		▨	▨	
	9-12	After the second dentition greater growth in height Increase in the volume of muscles	Rapid structural development Coördination of muscular action and feeling Period of habituation	Training to a constant, straight bearing and easy, graceful walk Strengthening particularly of the back and abdominal muscles. Help to development of the chest	Fighting Admiration of strength, skill, hardihood, courage		▨	▨	▨	▨	▨	▨	▨
Coöperative-competitive Period	12-15	The beginning of greater growth of lungs and heart With girls; beginning of puberty	Accelerated development of association fibers	Greater stimulation of the activity of breathing and circulation Development of skill and courage Moderate exercises of duration	Recognition of group for self-advancement Control of resentment Fair play Loyalty			▨	▨	▨	▨	▨	▨
	15-17	Great increase of the heart muscle without alteration of the arteries With boys; beginning of puberty	Continued development of association fibers	Encouraging of alertness, a spirit of enterprise and daring Greater exercises of duration Exercises of strength to a moderate degree	Coöperation Obedience to group Sacrifice and service in interest of group			▨		▨	▨	▨	▨
	17-20	Achievement of puberty and in general of growth and height Greater growth in breadth	Continued development of association fibers	Highest achievement in exercises of quickness Growing capability to perform exercises of strength and duration	High ideals of sportsmanship Fortitude Magnanimity Justice			▨		▨	▨	▨	▨

the affairs of life. All social, moral, and civil leaders, reformers, and martyrs have possessed in a high degree this primitive instinct trained to a higher and nobler expression.

Corrective. — Games supply exercises best adapted to develop in a normal child perfect physical form and proportion. This is obviously so inasmuch as they involve the types of activity which shaped the body in the process of evolution. When the body of a child has become ill-formed through some cause or other, games, wisely chosen, may supply a most valuable corrective.

Vicarious. — The value of a game is not alone to the players. Games benefit those who only stand and wait. The sympathetic participation of little children in the game they are watching is evident to the observer. Heightened color, deepened breathing, accelerated heartbeat, joyous emotion, muscular movements, are all present. The recreational value of professional baseball to the spectators is due not alone to a shifting of attention from ordinary channels to the game but also to a genuine participation, to a degree, in all the emotions and movements of the players themselves.



Practical Application. — Games serve a fundamental need in education, physically, mentally, morally, and socially and should be regarded as essential to a school curriculum. For that portion of a community not in educational institutions, adequate play facilities are as truly necessary for social order and civic progress as our lecture halls, reading rooms, libraries, and museums.

Time to be given to Plays and Games. — The following diagram suggests the amount of time that might profitably be given to plays and games at different ages.

Selection of Games. — Games should be selected to meet the peculiar needs and opportunities of the successive periods of development. Physically, they should further the best physiological growth at the period of their most rapid development. Mentally, they should provide expression for the nascent interests and emotions of the period. Morally, they should stimulate conduct in accord with the elemental virtues and ideals toward which there is an instinctive response. Socially, they should involve an expression of the social interests and the form of social organization adapted to the stage of development.

The following chart may prove suggestive in relation to the choice of games. G. E. J.

For philosophical theory of games, see Play.

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See also the references under Athletics; Gymnastics; Physical Education; Play, etc.

GAMES, PSYCHOLOGY OF. — See Play.

GAMMON THEOLOGICAL SEMINARY, ATLANTA, GA. — An institution for the training of ministers for the Methodist Church. The A.B. degree is required from candidates who wish to proceed to the degree of bachelor of divinity. Diplomas and certificates are granted for shorter courses.

GANGLION. — A group of nerve cells. See Nervous System.

GARDENS, SCHOOL; GARDENS FOR CHILDREN. — Most gardens which are definitely planned with reference to the education of groups of children are under the management of schools, and hence are usually known as school gardens. In America and England many excellent gardens are conducted for similar educational ends, but quite independently of schools. Hence the term school garden has come to be applied rather loosely to any children's garden designed for educational purposes, especially for teaching about plants and methods of gardening by the active or laboratory method. This latter qualification distinguishes school gardens from botanical gardens, which are usually of educational value to children in that they exhibit plants merely for observation.

As to the definite educational aims of school gardens, the great majority of those in continental Europe were originally intended for teaching practical gardening and agriculture as a phase of vocational education; and there is developing a similar tendency in some villages and rural districts of America and England. But the great majority of school gardens in America and England and many in various countries of the continent of Europe are now being conducted as a phase of nature study with a general cultural rather than vocational aim. Probably nine out of ten of the children who have worked in American school gardens in the past ten years lived in towns and cities and had little prospect of ever engaging in the business of raising plants for market; so that the gardens have obviously not developed in response to stimulation by the growing agricultural phase of vocational education, but are now conducted simply as a very practical part of the larger nature study or general science movement which aims to present the scientific study of common natural objects and processes from the point of view of general elementary education. Only a relatively limited number of gardens in rural districts in America have been definitely modified to meet the demands of agricultural education, and this chiefly for specially selected pupils of high school age.

In many cities in the United States, notably at Cleveland, O., children's gardens have been made at the homes of individual pupils, but under the guidance of a teacher who gives general directions at school, and occasionally makes a tour of inspection. On the whole, the results from home gardens have been far more satisfactory than from school gardens, probably because of the great personal interest which children take in home gardens, and because the gardens have a definite influence in stimulating the desire to beautify home surroundings. School gardens are, however, needed for giving practical lessons before the pupils attempt to make gardens at home; and it seems to be the consensus of opinion that schools should maintain gardens of limited size for teaching purposes while encouraging the development of home gardening as far as possible.

Two general plans have been tried in school gardens: the individual-ownership system, and the community system. Under the first plan the garden is divided into plots which become the property of the individual pupils for a season, and the owners have absolute control of the produce. Under the community system the produce of the garden is either used for lessons in the school or is sold and the proceeds devoted to the school library, a hospital, sick children, or some other altruistic purpose. The first plan is the easier to administer; the second gives greater results. The two plans have been combined in some gardens, for example, by growing vegetables in plots controlled by individuals, and flowers in community plots, in the working of which all pupils coöperate.

Comenius, Rousseau, Pestalozzi, and Froebel recommended the development of children's gardens for educational purposes. In the first half of the nineteenth century the educational authorities of several German states introduced gardening into rural schools, and the movement later extended to many city schools. Berlin has large grounds outside the city limits, and any child may have space for a small garden. Several German cities do not place emphasis upon work by the pupils, but have botanical gardens for instruction by observation and for supplying nature-study materials to the schools. In short, the German city schools maintain gardens for general educational rather than for vocational purposes. Following the example of German gardens, Sweden, Austria, Belgium, Holland, France, Switzerland, and Russia have given official encouragement to school gardens within the past fifty years. In these countries the rural schools have been encouraged to establish gardens, and in the beginning the aim seems to have been entirely vocational. The total number of gardens connected with schools on the continent of Europe is now over 100,000. Switzerland requires special training in gardening in the normal schools, and since 1885 has subsidized elementary-school gardens. For more than thirty years every rural school in Belgium has had a garden, and the training in gardening is believed to have been invaluable in relation to the chief industry of the country. The normal schools of France teach agriculture and gardening, and it is estimated that over 40,000 schools have gardens. It is an open question, however, whether a large proportion of these have been of much value to the pupils. Russia has encouraged gardening for more than twenty years, and many schools assign small gardens to individual pupils. The normal schools teach gardening, and special courses have been given to teachers. In Holland the small children have gardens, apparently intended for nature study, rather than for train-

The Colorado State Normal.

Brooklyn Truant School.

A Girls' School, Leipzig, Germany.

Garden of a Boys' School, Plauen, Germany.

School Garden, Batac, Ilocos Norte, Philippine Islands.

Studying Arboriculture and Agriculture, Graumont, Belgium.

SCHOOL GARDENS.

ing in the business of gardening. Italy has within recent years shown interest in school gardens. Ten years ago there were less than a hundred gardens in Great Britain, and these not officially connected with the school system. Since 1904 gardening has been encouraged by special grants to the schools. Many gardens have been established in connection with elementary day schools, and also in evening schools for pupils who must work during the day. In the day schools the nature study aims seem to prevail, but the gardens are expected to have a vocational influence. England has been often criticized for slow development of school gardens, but it should be noted that a widespread popular interest in home gardening has probably been a good substitute for hundreds of the inefficient school gardens established officially on the continent of Europe.

In Canada interest in school gardens has developed rapidly in the past ten years. In 1905 there were more than a hundred gardens in Nova Scotia under the direction of the superintendent of education for the province. In each of the other eastern provinces five gardens were established in connection with the Macdonald schools in 1904. Many other gardens are now an established part of the school work, and the schools receive special grants from the education departments. There are many school gardens in the Northwest Territories.

Most of the gardens in the United States have been organized during the past ten years. Among the pioneer gardens which attracted general attention were the wild flower garden at Roxbury, Mass., in 1891; the gardens of the National Cash Register Company, at Dayton, Ohio, 1897; at the Hyannis (Mass.) Normal School, 1897; the home gardens at Cleveland, Ohio, 1900; the Hartford (Conn.) School of Horticulture, 1900; at Hampton Institute (Va.); and the Children's School Farm in New York City, 1902. Most cities have school gardens, but they are usually fostered by individuals or organizations independently of official connection with the schools. As examples of such outside encouragement of gardens the following have been prominent: Home Gardening Association of Cleveland, Massachusetts Horticultural Society, Twentieth Century Club of Boston, Woman's Institute of Yonkers, Massachusetts Civic League, Missouri Botanical Garden, National Cash Register Company, Vacant Lot Cultivation Association, United States Department of Agriculture, numerous local agricultural societies, and the Park Department of New York City. In only a few cities have boards of education helped financially. The Philadelphia school system maintains some gardens, but private individuals and organizations outside the system have been active with smaller gardens in that city. Cleveland, Rochester, and a few other cities officially provide funds for gardens as part of the work of schools. Many other cities and towns recognize gardening as part of the course in nature study, but do not provide for the material basis for conducting the gardens needed to carry out the school program. The vast majority of the school gardens in the United States are still officially independent of schools and conducted on the personal responsibility of teachers, principals, and others who are interested in the school garden movement. As an example of good results in spite of lack of official encouragement, New York City has over eighty scholo gardens, many on school grounds, but conducted by enthusiastic members of the New York School Gardening Association without appropriations from school funds. In fact, most school gardens in the United States outside the largest cities need little financial help from the school authorities, for in most places land is available, the pupils do the work, the seeds cost little and the produce will pay for them, and an energetic director can usually find ways and means for collecting the necessary tools. There is probably an advantage in that gardens without the financial support of schools tend to develop the resourcefulness of the individual pupils and to awaken the interests of their parents and friends. Instruction in methods of gardening offers no special difficulties now that gardening is commonly recognized as a very important phase of nature study and science, and hence properly comes under the direction of teachers of those subjects. The common result is that the garden work is used and correlated in the classrooms much more than would be possible by special garden teachers. The fact is that throughout the United States there is little demand for special appropriations for school gardens, except for modest equipment for tools. Much more important is the official recognition of gardening as a phase of nature study and therefore a legitimate part of the regular work of teachers assigned to the classes in that subject.

The care of school gardens during the long summer vacation is a difficult problem which has retarded the general success of the movement. A hired gardener is undesirable, for in his work the pupils have little interest. School gardens will be most useful if conducted by the pupils and for the pupils of the school. The most satisfactory plan, judged by educational results and pupils' interest, is the committee system. This means that the director of the garden appoints groups of pupils as committees charged with the care of the entire garden for set periods during the vacation, and required to report to the school in September. Some voluntary supervision by interested adult citizens is usually possible, especially where there is some local society which is interested in the garden movement.

With regard to the general educational influence of school gardens, it has been claimed by numerous teachers that many pupils make more rapid progress in their book studies after being aroused by the garden work. Such increased efficiency has been found to have an indirect moral influence, and in many cities the boys engaged in gardening seem to have lost their former interest in mischief making, perhaps because their time has been occupied with the interesting work of the gardens. Probably a large part of the advantages claimed for manual training as a phase of education applies to school garden work, and there is the additional gain from the garden in that the work is in the open air and combined with nature study. Under such conditions the garden may become a most important agency for healthy recreation, for developing an interest in nature, and for giving the pupil direct contact with a phase of industrial education, which may be of vocational value to some, but of far greater importance to the many, in that it gives them a sense of personal relationship with that vast part of the world's work which is centered around the cultivation of plants for human use. This tendency of gardens to develop a personal interest in plant growing outside of the plot controlled by the pupil is so marked that several societies concerned with the beautifying of cities by encouraging the cultivation of plants in both private and public grounds, wherever possible, have officially recognized school gardens as very important factors in developing personal responsibility for better civic conditions. No doubt a garden can be made very helpful in this direction, but the result will come from the teaching and not from mere digging in the soil. In fact, the value of merely working in the garden has been overestimated, and the future efficiency of gardens as part of general education will depend upon lessons which are drawn from materials and conditions available in well-managed school gardens. The purpose of school-gardens is not simply to raise plants, but rather to use the methods of gardening and the growing of plants as a concrete basis for one phase of education. Judged by this standard, a large number of gardens for children are not yet real school gardens or educational gardens, for efficient instruction is not given the pupils. M. A. B.

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GARDENS AND GARDENING. — See Botanic Gardens; Horticulture, Education in; Gardens, School.

GARFIELD, JAMES ABRAM (1831–1881). — Statesman and educator, graduated from Williams College in the class of 1856. He was professor in Hiram College for three years, and president of the college four years. As a member of the Congress of the United States he took an active interest in educational legislation, and was largely responsible for the establishment of the Bureau of Education. His *Speeches on Education* (Boston, 1882) include his most important contributions to the literature of education. W. S. M.

Reference: —

Hinsdale, B. A. *Garfield and Education.* (Boston, 1882.)

GARLAND, LANDON CABELL (1810–1895). — College president, educated at Hampden-Sidney College. He was professor of mathematics in Washington (Va.) College, Randolph-Macon College, the University of Alabama, and the University of Mississippi, and president of Randolph-Macon College and Vanderbilt University. Author of textbooks on mathematics. W. S. M.

GAUDEAMUS IGITUR. — Probably the best known as well as the most frequently sung of student songs in the world. The origin of this famous poem was long in doubt, but painstaking German research has established the fact that in its present form it does not go back much beyond the middle of the eighteenth century. Those who, guided solely by the content of the song, would refer it back to the whimsical laments over the vanity of human wishes and the advice to "eat, drink, and be merry, for to-morrow we die" found in the songs of the Goliards (*q.v.*; see also the article on Carmina Burana), may find some satisfaction in the fact that the basic element in the *Gaudeamus* has been traced back to a song found in a French Ms. of 1267. This is a penitential psalm, in which the following lines occur:—

> Vita brevis, brevitas in brevi finietur;
> Mors venit velociter et neminem veretur.
> Ubi sunt qui ante nos in hoc mundo fuere?
> Venies ad tumulos, si eos vis videre,

which will be recognized as parts of the modern *Gaudeamus.* But there seems to have been a number of songs which opened, at any rate, with the word *Gaudeamus.* On this account probably the well-known verses have been referred to a greater antiquity than they deserve.

Sebastian Brandt in the *Ship of Fools* (ch. 108) refers to the *Gaudeamus*, and a woodcut in the edition of 1494 represents the ship of fools and the words *Gaudeamus Omnes* issuing from the mouth of one of the passengers, written in a notation which does not call up the modern tune. Hans Sachs, in a poem written in 1568, also refers to a *Gaudeamus.* But none of these continues with the vigorous and meaningful *igitur.*

The earliest known Latin version (there is a version in German by J. C. Günther, written in 1717, beginning *Bruder lasst uns lustig sein*) of the modern *Gaudeamus* is found in a (Ms.) copy of student songs in the Royal Library at Berlin, which was written before 1750. The version is as follows:—

Gaudeamus igitur
Juvenes dum sumus;
Post molestam senectutem
Nos habebit tumulus.
Ubi sunt qui ante nos
In mundo vixere?
Abeas ad tumulos,
Si vis hos videre.
Vita nostra brevis est,
Brevi finietur;
Venit mors velociter,
Neminem veretur.

On the basis of this the other versions arose, each body of students adding something new or topical, or eliminating something. A Latin and German version is found in a Jena Ms. of 1776, showing that there was reason in the order issued at Halle by the university authorities, forbidding the singing of the song on account of its degrading vulgarity. The verses were rescued from the mire, however, in 1781, by C. W. Kindleben, at one time pastor, university docent, and assistant teacher under Basedow at the Philanthropinum at Dessau. Kindleben's reputation was not of the best; he lost every position he held through his dissolute ways. But it was this man who cleansed the *Gaudeamus* of its obscenities and published it with a translation in its present form in *Studentenlieder. Aus den hinterlassenen Papieren eines unglücklichen Philosophen, Florido genannt, gesammelt und verbessert von C. W. K.* 1781. After the student revival which took place about 1813, the song found its way rapidly into all the student song books and Commers-books, until it became the property of students in universities and schools the world over.

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Schwetchke, Gustav. *Zur Geschichte des Gaudeamus-igitur.* (Halle, 1877.)
Symonds, J. A. *Wine, Women and Song.* (Portland, Me., 1899.) Contains an English translation.

GAUSS, KARL FRIEDRICH. — One of the foremost mathematicians and astronomers of the nineteenth century. He was born on Apr. 30, 1777, at Brunswick, Germany, and died on Feb. 23, 1855, at Göttingen. He was educated at Göttingen, and in 1807 he became professor of mathematics and director of the observatory in that university. To him more than to any other one person is due the prominence that Göttingen attained in the nineteenth century as the mathematical center of Germany. There was no field of mathematical activity in which he was not interested, and in most of those that were open in his time he was a successful worker. The number of his contributions was very great, notably in the theory of numbers, theory of electricity and magnetism, the interpretation of complex numbers, and mathematical astronomy. D. E. S.

GAZA, THEODORE (1400–1475). — Greek scholar and teacher of the Renaissance period, who came to Italy about 1440. Introduced to Vittorino da Feltre (*q.v.*) by Filelfo (*q.v.*), he studied Latin under him and taught Greek and copied Mss. in his school at Mantua. In 1444 he became the first public professor of Greek at Ferrara, and lectured on Demosthenes. In 1457 he was summoned by Nicholas V to Rome, where he taught Greek and assisted in translating some of the Greek classics. In 1455 he translated books for King Alfonso of Naples; he later returned to Rome, which he again left before his death, which occurred in a monastery in Lucania. Gaza wrote a Greek Grammar (γραμματικὴ εἰσαγωγή), which Erasmus used at Cambridge and translated into Latin and Budæus used at Paris. Copies of the *Iliad* written by Gaza are still extant, one in Florence and the other in Venice. In the controversy on the superiority of Plato and Aristotle, Gaza strongly defended the latter, several of whose works he translated.

References: —

Sandys, J. E. *History of Classical Scholarship*, Vol. II. (Cambridge, 1908.)
Woodward, W. H. *Vittorino da Feltre.* (Cambridge, 1905.)

GELASIUS. — Bishop of Rome (492–496), and author of the *Decretum Gelasii de libris recipiendis et non recipiendis.* The importance of Pope Gelasius in the history of education is due entirely to his famous decree on the canonical books of the Bible and the authoritative and approved writings of the Fathers of the Church. The decree differs from later indexes of books in that it not only gave a list of books which were condemned, but also a list of books which were approved as standards of orthodoxy. The decree was issued at a Roman synod held by Gelasius, but in its present form it contains material much earlier and has been subjected to various interpolations. The final section, however, which gives the list of books to be received or rejected, was, with the exception of manifest interpolations, the work of Gelasius. By passing judgment upon earlier writers determining which should be regarded as setting the norm for orthodoxy, the decree undoubtedly affected profoundly the course of studies in the Church. Among other effects of the decree was the elimination of the older Alexandrine influence, *e.g.* that of Clement of Alexandria (*q.v.*). It did not become generally known in the Church till some time after Gelasius; it was not until two hundred years after its publication that it is quoted, and not until 860 that it was connected with the name of Gelasius. From that time on its influence was constantly felt. J. C. A. Jr.

See Literary Censorship.

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Mansi. *Concilia,* Vol. VIII. (Florence, 1759–1798.)

GEMMA FRISIUS (1508–1555). — The family name of Gemma the Frisian was Rainer or Regnier. He was born at Dockum, in East Friesland, on Dec. 8, 1508, and died at Louvain on May 25, 1555. He was a physician, holding the chair of professor of medicine at Louvain; but he is better known as one of the leading textbook writers of his century in France on arithmetic and astronomy. His most famous textbook is the *Methodus arithmeticæ practicæ* (Antwerp, 1540), of which there were at least fifty-nine editions before 1601. He also wrote upon astronomy, and first suggested the idea of finding longitude by the help of a chronometer in his *De principiis astronomiæ* (Paris, 1547). His influence upon arithmetic was more marked than that of any other Latin writer of his century. His son, Cornelis (1535–1577), was professor of medicine and astronomy at Louvain, and wrote on astronomy and philosophy. D. E. S.

GENERAL EDUCATION BOARD. — An organization chartered by Congress in 1903 and originating with Mr. John D. Rockefeller's Committee on Benevolence. The plan of such an organization was designed and adapted to assist Mr. Rockefeller in distributing his gifts to education, but it was also intended to meet a wider need and to afford a medium through which other men of means, who desired to promote education in the United States, could do so in a systematic, intelligent, and effective way. The gentlemen forming the first Board were the late William H. Baldwin, Jr., Wallace Buttrick, the late Hon. J. L. M. Curry, Frederick T. Gates, Daniel C. Gilman, Morris K. Jesup, Robert C. Ogden, Walter H. Page, George Foster Peabody, John D. Rockefeller, Jr., and Albert Shaw. The gifts of Mr. Rockefeller to the Board and placed under its absolute control amount to $32,000-000. Others have contributed smaller amounts, among them a gift of $200,000 for rural negro education by the late Miss Anna T. Jeanes.

The work of the General Education Board now falls into four main divisions: —

1. *The promotion of practical farming in the Southern States.* — Through the United States Department of Agriculture, under an agreement begun in the year 1906, the Board has made contributions for this work aggregating $405,700. The method employed is that of demonstration farms. There are now (1911) 196 men at work supervising demonstration farms, and 19,579 farmers are pursuing agricultural methods under such direction. One hundred and fifty-four thousand farmers are pursuing similar work, influenced by those farmers who are under the immediate supervision of the agents. Nine thousand eight hundred and fifty-nine boys, from twelve years of age and up, under the general designation of Boys' Corn Clubs, are performing practical agricultural demonstration on their fathers' farms, and are making their experiments the basis of agricultural study in the schools.

2. *The promotion of public high schools in the Southern States.* — The General Education Board appropriates to each state university or to the state department of education a sum sufficient to pay the salary and traveling expenses of a special high school representative, who arouses and organizes public sentiment favorable to public high schools, and who secures the establishment and maintenance of public high schools. Since the beginning of this coöperation on the part of the General Education Board with state universities and state departments of education, 703 new public high schools have been established, $6,390,780 have been raised by the people of the several states for buildings and equipment, and the annual sum available for the support of public high schools has been increased by $1,332,667.

3. *The Promotion of Institutions of Higher Learning.* — The General Education Board uniformly makes its gifts for endowment. Appropriations by the Board for higher education have been made as follows: In the Southern States, $2,309,000; in the Western States, $2,510,000; in the Eastern and Middle States, $1,805,000. Total, $6,624,000. These gifts on the part of the General Education Board make up an approximate total of $25,406,000, a sum which represents the increase of educational endowment and equipment of the eighty-two colleges and universities in the United States to which gifts from the Board have been made to date (1911).

4. *Negro Education.* — The Board has contributed $473,239.76 to schools for negroes. In this connection it should be said that negro farmers have shared fully in the coöperative demonstration work described above. It is the policy of the General Education Board to work through existing institutions and agencies and not itself to undertake independent educational work. E. C. S.

Reference : —

Ayres, L. P. *Seven Great Foundations.* (New York, 1911.)

GENERAL METHOD. — Methods of teaching which are fundamental to all the school branches, and therefore in general use, are included under the term "general method." The term is used in contradistinction to "special method," which is applied to a method used only in a single subject. Sometimes "principles of teaching" is used synonymously with "general method," the former implying a treatment in terms of theoretic generalizations or laws, and the latter one in types of practical procedure. H. S.

See METHOD, TEACHING; SPECIAL METHODS; TEACHING, TYPES OF; TEACHING, PRINCIPLES OF.

GENERAL TERM. — SEE CONCEPT.

GENERAL THEOLOGICAL SEMINARY. — Established by the General Convention of the Protestant Episcopal Church in the United States in 1817 and incorporated in 1822. Instruction began in New York in 1819. It was removed to New Haven, Connecticut, in 1820, but returned to New York in 1822. It is the only seminary in the Episcopal Church under the control of the General Convention. The buildings include a large chapel, lecture hall, nine dormitories, library, gymnasium, refectory, and nine residences for dean and professors. The halls can accommodate 150 students. In 1911 there were 143 students, fifteen professors and instructors, and one lecturer. It confers no degree on graduation. The degree of Bachelor in Divinity is conferred for graduate work only. The degree of Doctor in Divinity is conferred for work required or *honoris causa.* There are about 1800 graduates, of whom nearly 1000 are living, and about 1000 former students who are not Alumni. C. B. Z.

See THEOLOGICAL EDUCATION.

GENERALIZATION. — The process by which a principle or law is reached; the term is also used to denote the product. The term expresses the use or function of induction, which endeavors, beginning with a number of scattered details, to arrive at a general statement. Generalization expresses the natural goal of instruction in any topic, for it works a measure of economy and efficiency from the standpoints alike of observation, memory, and thought. The number of particulars that can be obtained is limited. When, however, different cases are brought together, — and this bringing together is expressed in a general principle, — a great variety of cases are practically reduced to one case, and further observation is freed to attack new particular things and qualities not yet systematized. Exactly the same holds good for memory. There are a few prodigies who can carry in mind an indefinite number of unrelated details; but most persons need the help of generalizations in order to retain special facts and to recall them when needed. Logically, a principle not only sums up and registers the net intellectual outcome of a great many different experiences which have been undergone at diverse times and places, but is an illuminating and clarifying means of interpreting new cases that without it could not be understood.

Because the older deductive, classificatory schemes of instruction began with a statement of the law or principle, educational reformers who were influenced by the scientific movement toward induction were compelled to emphasize the later and derived place occupied by generalization in the intellectual life. Zealots for the new method sometimes swung to the extreme of reaction against universals, and, treating observation and imagination of particulars as an end in itself, neglected the importance of generalization as a normal terminus of study. Another educational error is to suppose that generalization is a single and separate act coming by itself, *after* the mind has been exclusively preoccupied with particular facts and events. To the contrary, generalization is a continuous, gradual movement away from mere isolated particulars toward a connecting principle. A necessary part of the work of instruction is, therefore, to make the conditions such that the mind will move in the direction of a fruitful generalization as soon as it begins to deal with and to collect particulars. The resulting generalization will, of course, be crude, vague, and inadequate, but, if formed under proper conditions, it will serve at once to direct and vitalize further observations and recollections, and will be built out and tested in the application to new particulars. This suggests the final educational principle: A generalization or law is such not in virtue of its structure or bare content, but because of its use or function. We do not first have a principle and then apply it; an idea becomes general (or a principle) in process of fruitful application to the interpretation, comprehension, and prevision of the particular facts of experience. J. D.

See ABSTRACT AND CONCRETE; CONCEPT; EMPIRICAL.

GENERALIZED HABITS. — See HABIT; also FORMAL DISCIPLINE; ABILITY, GENERAL AND SPECIAL.

GENERIC IMAGE. — When one sees a single object and remembers it, he carries away a more or less complete reproduction of the experience which he derives through contact with this object. The remembered experience is in the form of an image. After contact with a number of different objects closely related to each other in character, memory reflects certain elements and drops others. Those characteristics which are common to all of the specimens stand out with increasing vividness; those characteristics which belong to single individuals tend to be obliterated. There arises in this fashion a generic image. Sir Francis Galton used the figure of a composite photograph in describing these generic mental images. The analogy is undoubtedly justified in certain cases, although it is probable that very few such images are used by the ordinary observer in his common experience. C. H. J.

See General Ideas; Ideation; Image; Memory; Visualization.

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Huxley, T. H. *Hume.* (London, 1881.)
Galton, F. *Inquiries into Human Faculties.* (*Appendix.*) (New York, 1883.)

GENETIC METHOD. — Mental processes can be studied by a variety of different methods. Thus, they may be analyzed or they may be studied with reference to their relation to the general life processes of the individual, or, finally, they may be studied with reference to their development and the development of the individual who possesses them. The relative level of evolution reached by the individual may also be studied. Whenever the problem of development or evolution is foremost the method of treatment is said to be the genetic method. Thus one may study the growth of a tendency on the part of children to use abstract ideas. The growth of this tendency is a genetic process, and the study of the habit constitutes a genetic problem. Again, one may study the presence of ideas in animals. There has been recently an increasing tendency to recognize the fact that psychology can be productively applied to education only through the working out of genetic methods. In some cases the term "genetic" has been used in a limited sense to apply to the special problems of child study; but this restriction of the term is misleading, and any form of study of mental development or mental evolution should be included under the term "genetic." C. H. J.

See Child Study; Psychology, Genetic.

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Kirkpatrick, E. A. *Genetic Psychology.* (New York, 1909.)

GENETIC PSYCHOLOGY.— See Psychology, Genetic.

GENEVA. — See Calvinists and Education; Switzerland, Education in.

GENEVA COLLEGE, BEAVER FALLS, PA. — A coeducational institution which was opened in 1849 by the Reformed Presbyterian Church of North America at Northfield, Ohio, and moved to its present location in 1880. Preparatory, collegiate, music, and fine arts departments are maintained. The entrance requirements are equivalent to about fourteen points of high school work. The degrees of Bachelor of Arts and Bachelor of Science are conferred on those who complete the requirements, which include residence for at least three fourths of the college course at an accredited college with the senior year at Geneva. There is a faculty of twenty-three members.

GENEVA, SWITZERLAND, UNIVERSITY OF. — Established in 1873, being the outgrowth of the Academy founded by the Republic of Geneva in the year 1559. The theological faculty of the old Academy attained a period of considerable renown under men like Calvin and Beza. During the stormy days of the seventeenth century the institution entered upon a decline, but was given a new lease of life as a result of the persecutions of the Huguenots in France, the Academy gradually having become the acknowledged center for the dissemination of Protestant culture in French-speaking territory. From 1798 to 1814 the Academy was in French hands.

The present university comprises the faculties of Protestant theology, law, medicine (1876), letters and social science, and pure science, the language of instruction being French. Affiliated with the institution are a natural history museum, a botanical garden, and an observatory. The library contains over 170,000 volumes and about 1800 manuscripts. The University of Geneva is the second largest institution of higher learning in the Swiss Confederation, being exceeded in the number of students only by Berne. During the winter semester of 1909–1910 there were enrolled 1915 students, of whom about half were women. Of the matriculated students only 23 were registered in the theological faculty, while the medical school attracts the largest number of students, viz., 624, including 372 women. As at all of the Swiss universities, the number of non-matriculated students is relatively large, 136 men and 327 women. R. T., Jr.

Reference: —

Borgeaud, C. *Histoire de l'Université de Genève,* Vol. I, 1559–1798. (Geneva, 1900.) Vol. II, 1798–1814. (Geneva, 1909.)

GENIUS. — A term used somewhat loosely to indicate the highest type of human ability. Below genius comes the grade of talent, and below talent ordinary ability. It is evident, however, that these grades are not enough to indicate very definitely the rank of any individual. Galton in his study of hereditary genius distinguishes eight classes above that of ordinary talent. Cattell endeavors to determine by a statistical study of biographical dictionaries the thousand most eminent men in history. These he ranges in regular order on the basis of the amount of attention to which each was deemed worthy by the various editors. Thus each individual is given a specific place instead of being assigned to a group. He concludes that the ten most eminent men are Shakespeare, Mahommed, Napoleon, Voltaire, Bacon, Aristotle, Goethe, Cæsar, Luther, and Plato.

Genius is more commonly treated according to the special sort of ability involved, since men may show the highest power in certain fields and be commonplace or even defective in other respects. The leading types seem to be the artistic, the intellectual, and the practical. The artistic type includes literary genius, the intellectual embraces philosophic and scientific power, while the practical covers such fields as statesmanship, business ability, and generalship. It is possible that outside these powers there lies another group, the moral and religious. However, in so far as these gifts involve intellectual qualities, they are allied to the philosophic and artistic types. On the other hand, they are usually associated with intensity of sympathy, a power of self-sacrificing service, and a firmness of adherence to ideals that constitute of them a somewhat distinct kind.

The genius may, from a biological point of view, be regarded as a variant from type. It must be noted, however, that his variation is in the direction of extraordinary new efficiencies. Much has been made by Lombroso and others of the idea that genius is allied with, if not a form of, insanity. It is true that many men of genius have shown signs of insanity. It would seem likely that the marked ascendency of certain powers in genius would involve a lack of balance which might amount or lead to insanity. Especially in the artistic type do we find such abnormalities. Nevertheless, even the artistic genius must show an excellence of judgment in reference to his art which suggests a " method in his madness." In general, the genius owes his success in the field of his preeminence to the sanity which he displays therein, although his emotional intensity, his nervous sensitivity, his vigor of imagination, or his power of concentration may lead him into eccentricities or undermine his judgment.

The interpretation of the genius as a degenerate is closely associated with the view that he is insane. The loosening of inhibitions, the emotionalism, and the general neuropathic condition found in degenerates may lead, especially in art and religion, to results that seem to have a touch of genius. At least, they attract attention, and often help the one who employs them to get a following. On the other hand, it is quite certain that, in general, the genius displays variations that are in advance of his type. He is the *superman* rather than the *degenerate*. Like the insane or the eccentric, he defies rule and precedent, yet in the interest of greater rather than less efficiency. His originality is not mere variation, but meets the requirements of judgment.

The studies of Galton and Wood show clearly that genius is inherited. Since, however, it is rare that both parents possess extraordinary power, the children of geniuses show, as a rule, a marked tendency to regress toward mediocrity. The absence of any form of selection that favors the survival of the very talented as against the common run of men makes it unlikely that this tendency toward regression shall be interfered with. The genius can, therefore, hardly be taken as a prophecy of the type toward which the race is tending.

On the question of the dependence of the genius on his environment we have the common notion that opportunity is essential to greatness, opposed to the view, championed by Carlyle, that genius always creates its opportunities. While it is doubtless true that extraordinary gifts do not insure their possessor his proper rating, still the abilities of men of genius are usually sufficiently broad in scope to enable them to attain distinction along some of the lines of opportunity open to them. There are probably very few " unappreciated " geniuses, and most of those who rate themselves as such are, doubtless, because of their lack of some qualities essential to efficiency, properly characterized as "cranks."

Genius is frequently, if not usually, foreshadowed by precocity. This is especially true of artistic genius. Many of the greatest musicians have, like Mozart, been " infant prodigies." Literary power is the latest among the artistic gifts to display itself, but even here talent may be shown in childhood, as witness Goethe, Victor Hugo, Shelley, and Keats. Sometimes scientific and philosophic or administrative power is evinced in early youth. Newton, Berkeley, Herbart, William the Conqueror, and Alexander the Great are illustrations.

It has been thought that genius does its best work in the earlier years of life. The celebrated statement of Dr. Osler was to the effect that, although many great achievements were accomplished after the age of forty, still, the world would be where it is, if all great men had died at that age. Dr. Dorland's careful study of the history of eminent men shows, however, that the greater part of their extraordinary work was done after this age, and indeed, not a little after the age of sixty.

So far as education is concerned, the problem of training the genius does not differ from that of training any of more than average ability. The tendency toward uniformity in our schools may prove unfortunate for the unusual mind in two ways. It may keep him wasting time with the crowd, when his abilities would, if properly developed, put him far ahead. It may lay so much stress on studies in which he is not capable as seriously to retard the development of his special power. The school reformers are actively endeavoring to break up this mechanical uniformity of studies and of progress through the grades. Many devices are being developed for getting at the individual, for helping him to find his special bent, and for putting him in a position to progress as fast as his talents and energy will permit. All these will assist in the education of the genius, and although he may be less dependent upon environment than are those of inferior ability, nevertheless, he needs and profits by the proper education. It remains one of the leading problems of the school to discover and properly train the exceptional man. E. N. H.

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GENLIS, STÉPHANIE FÉLICITÉ DU CREST DE SAINT-AUBIN, COMTESSE DE — commonly known as MME. DE GENLIS (1746–1830). — One of the leading French women educators of her day. According to Sainte-Beuve, " She was a woman teacher; she was born with the sign on her forehead." She was governess in the family of the Duchesse de Chartres. Although an indefatigable critic of Rousseau, she yet constantly gives evidence of his influence. She was the author of *Théâtre d'éducation* (1779); *Adèle et Théodore* (1782), also known as *Lettres sur l'éducation; Les Veillées du château* (1784). A prolific writer, she was the author of nearly one hundred volumes. In addition to those noted above, her works on education include: *Discours sur la suppression des couvents de religieuses et sur l'éducation publique des femmes* (1790); *Discours sur l'éducation de M. le Dauphin* (1790); *Leçons d'une gouvernante à ses élèves, ou fragments d'un journal qui a été fait pour l'éducation des enfants de M. d'Orléans* (1791); *Discours sur l'éducation publique du peuple* (1791); *Nouvelle méthode d'enseignement pour la première enfance* (1800); *Projet d'une école rurale pour l'éducation des filles* (1802); *Les Dimanches, ou Journal de la jeunesse* (1816), published for only one year. F. E. F.

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GENOA, UNIVERSITY OF. — See ITALY, EDUCATION IN.

GENTRY AND NOBLES, EDUCATION OF. — The close connection between education and politics has been recognized from the time of classical antiquity. Plato in his *Republic* and Aristotle in his *Politics* laid down the principle of the vital importance to the state of the education of children. Throughout the Middle Ages, the education of the actual kings, princes, and other governors of the state was recognized as an essential preparation to the child, who was a prospective ruler. Treatises commonly described the duties of princes, and logically this led to dealing with the question of preparation for such duties. Thus, Thomas Aquinas wrote the *de Regimine Principum.* Occleve produced his *Regiment of Princes.* Italy was especially distinguished by its books on political philosophy, in the fifteenth century Pontano writing *de Principe*, Beroaldo the *Libellus de optimo Statu et Principe*, and Francesco Patrizi his *de Regno et Regis Institutione.* In England John of Salisbury wrote his famous *Polycraticus*, and and in 1531 Sir Thomas Elyot (*q.v.*) wrote the *Governour.* This last-named work is particularly noteworthy because a considerable portion of the book is taken up with the question of the education of the prospective Governour. This illustrates the connection which was felt by the older writers between education and political philosophy. If the prince or the governor, or by whatever name the ruler was called, had to rise to the responsibility of governing a country, then it is clear that the welfare of the nation is dependent largely upon the excellent training culture, or, in a word, the education of the prince or ruler. So that in the days of an absolute Tudor monarch, Erasmus wrote, as a matter of vital concern, an educational treatise on *The Institution of a Christian Prince*, and throughout the sixteenth, seventeenth, and eighteenth centuries, numberless educational treatises concerned themselves with the education of the prince.

After the devastating Wars of the Roses in England, the power of the old nobility was wrecked, and under the Tudors a new nobility and gentry arose, roughly speaking founded upon personal merit and achievement. The merchant adventurers, sailors, and warriors came into the higher classes concurrently with the development of Protestantism. As the new order of aristocracy came into power in the state, the books on education concerned themselves with the education of nobles. Thus Laurence Humphrey (*q.v.*) wrote his *Nobles* or *Of Nobility*, and it is interesting to note that he had written it first in Latin (as *Optimates* in 1560), showing that the Renaissance spirit was one which could assume that a politico-educational work to be read by nobles must be written in Latin. The fact that he also wrote it in English shows the advancing place of the vernacular also with the upper and governing classes. But the implication was that, as formerly, the education of the prince was the most important political aspect of education, and the desirability of the education of the nobles as well as princes was recognized as a national asset. In 1555 was published the anonymous *Institution of a Gentleman* (*q.v.*), and the significance is that the " gentleman " was becoming a more noticeable element politically, and, therefore, nationally claimed a higher education. On this theory, the broader the basis of the governing power, the wider will be the demand for education, to meet the required responsibility, until in an age of democratic government the demand will extend to universal education since, the power being in the hands of the people, there, too, must be placed the education and preparatory instruction to meet the responsibility. Another element in the education must be noted — that the "gentleman" stood in opposition to the "poor student." Accordingly, sometimes "the gentleman" stood outside the university and public school system, was educated at home by a private tutor, and afterwards, even if he went for a time to one of the universities, went also to one of the Inns of Court, and of course traveled on the grand tour of Europe. The education of the gentleman, therefore, became distinguished by its greater breadth. At the period of the Renaissance, too, the tradition of Italian models set in, as the revival of learning for Europe had its origin in Italy. This was at the very time that the courts of Italy had developed a standard of courtliness and chivalry far in advance of what was found elsewhere. The consequence was that England looked to Italy for the type of nobility and gentlemanliness founded on what obtained at Urbino, at Mantua, and elsewhere. The effect of these courtly ideals in education may be seen in the educational thought of Vittorino da Feltre (*q.v.*) and Guarino da Verona (*q.v.*). These ideals found literary expression in Baldassare Castiglione's *Cortegiano*, 1528 (*q.v.*). Roger Ascham (*q.v.*) in the *Scholemaster* (1570) says of this book, "To join learning with comely exercises Conte Baldesar Castiglione in his book *Cortegiano* doth trewely teach; which book advisedly read and diligently followed but one year at home in England would do a young gentleman more good, I wisse, than three years' travel abroad in Italy." Castiglione's *Cortegiano* was the climax of books on manners, which were of long standing (see MANNERS AND MORALS). The *Cortegiano* was translated into English in 1561 by Sir Thomas Hoby. Sir John Cheke wrote a letter to Hoby on the use of English in connection with his translation. (See CASTIGLIONE, BALDASSARE.)

After the *Governour* of Sir Thomas Elyot in 1531 the next books to notice are the *Institution of a Gentleman* (1555) and Laurence Humphrey's *Nobles*, 1560 (*q.v.*). In 1561 Sir Nicholas Bacon drew up *Articles for the Education of the Queen's Wards*, and about 1572 Sir Humphrey Gilbert planned his Academy for the Queen's Wards and other youth of nobility and gentlemen. (See *Queen Elizabeth's Academy*, Early English Text Society, 1869.) In 1570 "T. B." (? Thomas Blundeville, *q.v.*) translated into English John Sturm's *Nobilitas literata or A Rich Storehouse or Treasury for Nobility and Gentlemen*, and in the same year Blundeville translated from the Italian of Alfonso d'Ulloa the *Prince* of Federigo Furio, a Spaniard. It will be remembered that Roger Ascham's *Scholemaster* (1570) and John Lyly's *Euphues* (1577) are largely concerned with the education of gentlemen. Less known is an anonymous tractate in 1577 entitled *Cyuile and Uncyuile Life: a Discourse very profitable, pleasant, and fit to be read of all Nobilitie and Gentlemen. Where in forme of a Dialogue is disputed what order of lyfe best beseemeth a Gentleman in all ages and times, as well for education, as the course of his whole life to make him a person fit for the publique service of his prince and country, and for the quiet and comlynesse of his own private estate and callinge.*

In 1595 William Jones translated the treatise of Giovanni Baptista Nenna, under the title *Nennio. Or a Treatis of Nobility; wherein is discoursed what true Nobility is, with such qualities as are required in a perfect Gentleman.* Nenna maintains that a man *becomes* noble by the nobility of his mind, and that men and women equally become noble by learning. In 1598 J. Keper translated Count Hanniball Romei's *Courtier's Academy*, the representative book of the court of Ferrara. The later most representative English books are Henry Peacham's (*q.v.*) *Compleat Gentleman* (1622) and Richard Brathwaite's *English Gentleman* (1630) and *English Gentlewoman* (1631), the former dealing with topics from the point of view of the Cavaliers, whilst the latter are permeated with puritanic manners and morals. These ideals were to some extent combined in the *Gentleman's Calling*, 1659, perhaps the most popular book on the training of the religious gentleman which appeared in the seventeenth century. This book was followed in 1673 by the *Ladies' Calling*, which has considerable interest in the history of the education of gentlewomen. There is much controversy as to the author of these books. They have often been ascribed to Dorothy, Lady Pakington, but Mr. Macray in the *Dictionary of National Biography* (in his article on the life of that lady) considers it is more probable that they were written by Richard Allestree, an Oxford tutor.

In 1661 appeared Clement Ellis's *Gentile Sinner, or England's brave gentleman characterised in a letter to a friend both as he is and as he should be*, 2d ed., 1661 (Oxford), from a thoroughly puritan point of view. In 1678 John Gailhard (*q.v.*) wrote his *Compleat Gentleman*, which probably gives the best account of the grand tour as made by gentlemen of the time. About 1728 Daniel Defoe (*q.v.*) wrote his *Compleat English Gentleman*, first published in 1890, edited by Dr. Karl Bülbring, which is noticeable for its readiness to omit Latin from the studies of the gentleman. "You may," says Defoe, "be a gentleman of learning, and yet reading in English may do for you all that you want." After the end of the seventeenth century with the beginning of the establishment of charity schools (*q.v.*) and the development of technical and trade schools the extension of the term "gentleman" had widened out greatly, so that the idea of a "liberal" education and a gentleman's education became much more approximated.

The distinction between the education of the scholar and the gentleman in earlier times is perhaps best indicated by saying that after the Renaissance the progress of the academic centers was mainly in the direction of the development of the subjects of the medieval *trivium*, viz. grammar, rhetoric, and logic, whereas the great intellectual advances of the sixteenth and seventeenth centuries introduced what are called "modern subjects," *e.g.* mathematics, natural sciences, vernacular languages, foreign and English. These subjects were almost entirely ignored by the universities and grammar schools. Such "outside" subjects, together with physical exercises, such as riding the great horse, fencing, gymnastics, were precisely the subjects studied by the nobility and gentry, as is shown in the proposed curricula of the projected Academies (see GILBERT, SIR HUMPHREY; KINASTON, SIR FRANCIS; GERBIER, SIR BALTHASAR; ACADEMIES, COURTLY). We are therefore driven to the conclusion that it is to the records of the education of the gentleman and the nobleman that we must refer to trace the progress of the growing width of the curriculum rather than to the history of the universities and the grammar schools.

It is important to notice that the development of professional education — *e.g.* the lawyer, the physician, and the clergyman — was often along the lines of the modern subjects and thus by attraction came into the educational circle of noblemen's studies much more readily than into that of the university man as such, — the physician's studies, for instance, directly affecting the development of botany and zoölogy, which often were included in the nobleman's curricula. When England became richer after the increase of trade, consequent on the expansion of Queen Elizabeth's reign, the ranks of country gentlemen increased, and open-air pursuits and knowledge similarly developed, nobility and gentry joining in common studies, so that cultured gentlemen of the type of John Evelyn (*q.v.*) and the members of the Royal Society welded together still further professional and gentlemanly studies, until at last the universities found the pressure of inclusion of modern subjects too great to resist, if they were not to lose the students preparing for professional life.

The importance of the training of the gentleman in history and geography must not be overlooked. It is not only that all the writers on gentlemen's education prescribe these subjects as gentlemen's studies, but the writers and developers of the subjects were for the most part of the gentleman class. Both in history and in geography, also, it is to be noted that the beautiful folios, in which these subjects were printed, especially when illustrated with engraved pictures and maps, were expensive productions and could only circulate amongst men of means, and of these the nobles and the gentry were the chief book buyers, scholars contenting themselves mainly with Aldine octavos or Elzevir duodecimos, with only occasional folios, and these chiefly of theology or classical writers. Suggestions on the youth's studies by writers like Francis Osborn in his *Advice to a Son*, 1656, J. B. (Gent.) in *Heroic Education* (*q.v.*), and William Higford in his *Institutions*, 1658, illustrate the permeation of the gentry class by that time with a belief in the necessity of knowledge in history and geography.

Two other names deserve mention in the development of the education of the gentleman, — one in England and the other in the United States: Lord Chesterfield (*q.v.*), (1694–1773) and George Washington (1732–1799). In his famous *Letters to his Son*, Lord Chesterfield lays down the laws of worldly success for the young nobleman or gentleman. The youth's education was to be summed up briefly as good breeding.

Every detail of study, of conduct, of life, was calculated in the interests of worldly success. Samuel Johnson summarized the *Letters* in the criticism, "Take out the immorality and the book should be put into the hands of every young gentleman, for it would teach elegance of manners and easiness of behaviour." (See CHESTERFIELD, LORD.)

The *Rules of Civility* is only a commonplace book exercise of George Washington, written when he was fourteen or fifteen years of age. These *Rules* have been reprinted and edited by the late Mr. Moncure D. Conway, who suggests that the reading and writing of them probably had effects upon the development and character of Washington. He shows that the *Rules* copied by Washington were the work of a Jesuit, from the College of La Flèche, which was published in 1595, called *Bienséance de la Conversation entre les Hommes*. This was translated into Latin in 1617 by Leonard Périn, and was published in English as *Youth's Behaviour or Decency in Conversation amongst Men*, by Francis Hawkins, in 1646, said to have been translated by him at the age of eight years. (See MANNERS AND MORALS, EDUCATION IN.) From this book, Dr. Conway urges that Washington was taught that "all good conduct was gentlemanly, all bad conduct ill-bred."

The eighteenth-century training in gentlemanly conduct is probably represented somewhat leniently by the relatively high (!) standard of Lord Chesterfield. The reaction in the earlier part of the nineteenth century is shown by the reintroduction of the highest standards of gentlemanly training in the English public schools. The greatest figure of this period was Dr. Thomas Arnold (*q.v.*) of Rugby. His standpoint is represented by his *dictum:* "It is not necessary that Rugby should have three hundred pupils, but it is necessary that it should have scholars who are Christian gentlemen." The English public schools since his time have largely developed physical training through games, but whether concerned with intellectual aims or with that of the other features of school life, there can be no question that these schools have been, and are, permeated with the ideals of producing gentlemen, in the sense of requiring the code of honor of "playing the game," in every activity of life. In certain respects they have entered on the physical side into something of the old chivalric ideals, and occupy the place in English life to-day which the old Academies of Sir Humphrey Gilbert and Sir Francis Kinaston proposed to do, but failed to effect, for the training of gentlemen, in the sixteenth and seventeenth centuries. F. W.

See ACADEMIES, COURTLY; CHIVALRIC EDUCATION; MANNERS AND MORALS, EDUCATION IN; GEOGRAPHY, HISTORY OF THE TEACHING OF; and the articles on the various writers mentioned.

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GEOFFREY THE GRAMMARIAN (fl. 1440). — An important figure in the age immediately before the introduction of printing, not because of the scholarliness of the book associated with his name, but because the production of that book showed that the tide was turning, that the desire for learning was once again awakening in England, and that a new educational method was necessary. About the year 1440 a friar-preacher anchorite of Lynn in Norfolk, called Geoffrey, issued for manuscript circulation a volume entitled *Promptuarium Parvulorum Clericorum.* It was not the work of a scholar in the real meaning of that term. It was written by one whom the Anglo-Saxon Canons would have termed a "half-learned" person for the use of the still less learned. The book was a kind of English-Latin dictionary in which the English word is interpreted by one or more Latin words whose gender or declension, etc., is noted, while parallel English meanings are given. It is indeed curious that a book which did not pretend to scholarship should, even when the new learning and the new grammars had appeared and in the teeth of the condemnation of Erasmus, have more than held its own. The *Promptuarium* was first printed in 1499 by Pynson. Julian Notary published an edition in 1508, and Wynkyn de Worde issued no less than seven editions between 1510 and 1528. The book was English-Latin, and for that reason was of real help to beginners. The use of English in a grammar or wordbook was felt to supply a fundamental need, and was rapidly adopted by the new grammarians. Thus John Stanbridge, John Holt, William Lily, and Robert Whyttington led the new movement and adopted the new educational idea evolved by the educational necessities of the "half-learned" monk Geoffrey. In the old grammars or "donats" the use of English was forbidden in school time. It may be said that Geoffrey's work inspired all the school books of the transition period and created a new didactic method. J. E. G. DE M.

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GEOGRAPHY. — History of the Teaching of. — The practical and theoretical knowledge of geography extant at any given time constitutes a clear limit to the possibilities of its being taught, but the extreme importance of the practical side has insured throughout the course of history a greater approximation of teaching to the actual knowledge of the age, than in many subjects. Military and naval commanders found it necessary, and administrators required to know it both for home and foreign affairs. The extension of Greek influence through the establishment of colonies, and by enterprising navigation, made at least the Mediterranean Sea well known.

The first to systematize geography as a subject was Hecatæus of Miletus (fl. 520 B.C.), who thus became the Father of Geography as Herodotus was the Father of History. Herodotus, however, by his travels was enabled to introduce casually, into his histories, much geographical information as to continents, rivers, mountains, climate, products etc., of the countries he had visited, as well as descriptions of the tribes of foreign countries. The famous expeditions of Alexander the Great opened up knowledge and experience to Egypt on the south, the Caspian Sea on the north, and Persia on the east, revealing the "wealth of Ormuz and of Ind," and furnishing material for the imagination throughout the centuries. The greatest Greek geographer was Polybius (*c.* 210–128 B.C.), who traveled in Libya, Spain, and Gaul so as to "remove the ignorance" with regard to those lands. His opinion as to Hannibal's route across the Alps was based on actual travel and inquiries on the spot. He asserted that travel is necessary for the historian and geographer, and he clearly saw and illustrated in his histories the importance of geography, both physical and descriptive, to intelligent study of history. The subjugation of so large a part of the world by the Romans gave particular impetus to the extension and intension of geographical knowledge. Cæsar's *Commentaries* offer copious illustrations of the effect of conquests on geographical observation and interest. The explorations of Posidonius the Greek (130–50 B.C.) were of great importance in developing the knowledge of physical geography. But the great work of antiquity is the *Geography* of Strabo (*c.* 63 B.C.–*c.* 23 A.D.), which not only gives a complete survey of the geographical knowledge of his times, but also supplies an account of the preceding writers on the subject. Strabo is a truly comprehensive geographer, taking up mathematical, physical, descriptive, and historical aspects. He traces the influence of the physical features of a country on the character of inhabitants and on the course of the history of the country.

The other ancient writers on geography who require mention are Pomponius Mela, Pliny, Dionysius, and Ptolemy. The *de Chorographia* of Mela was a popular account of geography, and important, not for its contributions to learning, so much as from the fact that it remained a scholar's textbook of geography up till, and even beyond, the sixteenth century. Pliny's *Historia naturalis* (79 A.D.) had a section on geography, but it was very much a statistical geography abounding in names, without anything of the philosophical outlook of a Strabo. Dionysius Periegetes (reign of Domitian) wrote a geographical poem. From the point of view of the history of geographical teaching this poem of 1189 Greek hexameters has an importance altogether incommensurate with the commonplace nature of its geographical information. Claudius Ptolemy, who wrote in Greek his famous treatise on geography (*c.* 150 A.D.) probably at Alexandria, ranks as the greatest mathematical geographer of antiquity, and the ancient view of the solar system as revolving round the earth is known as the Ptolemaic system, in contrast with the modern view called after Copernicus. It was as an astronomer that Ptolemy showed conspicuous ability, and the great vogue of his books secured the alliance of astronomy and geography through the Middle Ages, and part of the Renaissance. It was not till the times of the great discoveries of the sixteenth century that geography became differentiated from astronomy, the combined studies being commonly known by the name of Cosmography. Ptolemy made the great change in map drawing by introducing the system of projection, recognizing the spherical nature of the earth, representing lines of latitude by parallel *curves*, whereas previously they had been denoted by parallel *lines*. (See MAPS.) Besides the treatment of mathematical geography and of maps, the rest of Ptolemy's *Geography* contains tables giving the latitude and longitude of the different places named in his various maps, and noticing the boundaries of countries, etc. The rest of the work is mainly astronomical.

The most intensive geographer of antiquity was Pausanias, a contemporary of Ptolemy, and author of an *Itinerary of Greece*, which gives a full account of Greek cities and sacred places, and noteworthy points on the routes from one to another of these, together with the legends and memories connected with each. C. Julius Solinus (third century A.D.) wrote a section on geography in his *Memorabilia*, which had nothing geographically original, and but little that is not contained in Pliny, whence he was known as the " Ape of Pliny." Nevertheless, the writers of the Middle Ages who wrote their encyclopedias, such as Isidore of Seville (*q.v.*) in his *Origines* (seventh century) and Brunetto Latini (twelfth century) in his *Tesoro*, borrowed directly in their geographical section from Solinus. In the fifth century A.D. Paulus Orosius in his *Histories*, a collection of annals of universal history, wrote an outline of universal geography which was very popular with medieval authors and teachers.

The geographical writers of antiquity, Herodotus, Polybius, Strabo, Pomponius Mela, Pliny, Dionysius, Ptolemy, Pausanias, all of whom wrote in Greek, were lost to the Middle Ages. During the Renaissance period, and none the less because they wrote in Greek, they were restored to general knowledge, and with their renewed study ancient geography became a matter of serious study in the schools, both in the Latin translations and in the Greek original; ancient geography thus found a place in schools long before modern geography.

In the Middle Ages the development of geographical knowledge progressed slowly. Its progress in the period up to the first crusade of 1096 is chiefly connected in the earlier part of the period with the religious cosmographies or geographies, and in the latter part with the explorations, discoveries, and conquests of the Scandinavians. In the earlier period, as far as Christian countries are concerned, the cause of geography was bound up with the pilgrim-travelers, the convent maps, and the religious impulses which suggested the conversion of the heathen. The gain to exact knowledge was not great; the chief result was the development of geographical myth. The introduction of the Scandinavian element into European countries brought a vigor and enterprise, which communicated themselves in every direction, leading both to geographical discoveries as far as America and the Northern seas, and to a rereading and more direct knowledge of that which had already been noted. The work of Arabs in geography, reaching its height in the ninth century, included translations of the old Greek geographers, astronomical calculations, and even observatory work. Arab explorers traversed much of Southern and Central Asia, Northern Africa, and the

Mediterranean Sea coasts. From these experiences, with the wonder element thrown in, arose literature such as that of Sinbad the Sailor. Chinese geographical enterprise also was noteworthy. The Crusades led to all kinds of commercial, diplomatic, missionary, as well as pilgrim, travel, from which an immense acquisition resulted to geographical knowledge and tradition. Commerce between East and West Europe, between Mediterranean countries and northern countries, developed into a secular organization of merchandise, which produced an unecclesiastical and more scientific geography. Asia was explored by men like the merchant Marco Polo and Friar Odoric in the thirteenth century, and in the fourteenth century the Catalan Atlas (1375) attained a highly creditable form of thoroughness, and from that time the production of more exact maps marked the possibility of the transition of geography into an exact science. Civilized Europe in the fourteenth century had discovered the use of compass, astrolabe, timepiece, as well as maps. The art of navigation went forward by leaps and bounds. Oversea adventure vied with overland enterprise until in the first quarter of the fifteenth century Prince Henry of Portugal promoted geographical journeys, and opened up the era of Portuguese enterprise which culminated in 1486–1499 in the voyage round the Cape of Good Hope to Calicut by Diaz and Da Gama, and the discovery by Columbus of America. In 1511 Portuguese navigators had reached by the Eastern route the Molucca Islands, and in 1519 Magellan attempted the journey to them by the Western route. Sir Francis Drake circumnavigated the globe in 1577–1580, and Vitus Behring discovered the strait which separates America and Asia. Thus by the end of the sixteenth century, the main features of the Earth had been described, the continents had had their contours defined in maps; travels and discovery had made known country after country, people after people, and geography had come to its own, by practical experience. Much remained, of course, to be done in the way of filling up, particularly in the seventeenth century, but by the end of the fifteenth century and in the sixteenth century geography had reached the stage of self-consciousness. Exploration had provided itself with instruments and methods, so that by that time geography may be said to have become a science in the sense that earth knowledge became an established subject of study by deliberate methods, and the ascertained knowledge thence derived became available for dissemination, and brought the subject into the pedagogic survey, at any rate, for those who were attracted to the study of the advance of civilization. In England, from the time of Drake onwards, there was always a school of navigation in training, where students made geography in some form or other the study of their lives, and there was from the time of the collection of travels of Ramusio in 1550, of Hakluyt, 1598–1600, and Purchas's *Pilgrims*, 1613–1625, a solid body of writers and readers of travels.

Though the development of geographical knowledge had steadily advanced throughout the Middle Ages, the literature of the subject is almost a negligible quantity. It was inextricably mixed up with biblical, classical, and legendary material. Only one book stands out as important, viz., Marco Polo's *Book concerning the Kingdoms and Marvels of the East.*

In the early Renaissance period those works only could be regarded as literature which belonged to Roman and Greek antiquity. In school-teaching, throughout the sixteenth and seventeenth centuries, the study of ancient geography certainly almost entirely absorbed the attention of the teachers, as far as this subject was concerned. For the most part, the teachers confined themselves to the texts of ancient geographers, — particularly Pomponius Mela, Ptolemy, and Dionysius Periegetes, and the astronomical work of Proclus. Of the ancient geography textbooks, a printed copy of Pomponius Mela was sold in England as early as 1520. In 1585 Arthur Golding translated Pomponius Mela into English, and did the same service for the *Polyhistor* of Solinus. Of Dionysius there was an English translation in 1572 by Thomas Twyne. A Greek text of Dionysius was published at Eton *c.* 1607. In 1658 a most elaborate edition of Dionysius was furnished *ad usum tyronum* with Greek text and Latin translation and a most voluminous commentary, by William Hill, M.A., of Merton College, Oxford, and afterwards schoolmaster at Dublin. Philemon Holland's translation of Pliny's *Historia naturalis* was published in 1601, the second edition in 1634, and this was recommended for school libraries by Hoole in 1660. A comparative study of various textbooks and authorities enabled Cluverius in 1624 to produce a geography of ancient Italy, which Hallam describes as "the great repertory of classical illustration in this subject." The only other contemporary author's classical geography that needs mention is Ferrarius' *Lexicon Geographicum, Poeticum, et Historicum,* an edition of which was published in London in 1657. But there were, even at this period, men of larger vision in geographical study. In 1511 Erasmus (*q.v.*) advocated the study on account of its value in reading history and the poets. The school-teachers, however, supported Erasmus in the view that the chief importance of geography was to illustrate and elucidate classical writers and to provide copiousness of phrase in the descriptions introduced into themes and exercises in Latin and Greek writing. In 1523 Vives (*q.v.*) recommended the pupil to read Strabo and Ptolemy, though in reading the latter the lately introduced and more exact maps were to be preferred. Vives, however, further wishes the pupil to add the "ancient discoveries" in the East and West "from the navigation of our people" (the Spanish) and the collections of travels of Peter Martyr and of Raphael of Volterra, so that he may be regarded as the first advocate of the teaching of modern geography. In 1531 Sir Thomas Elyot (*q.v.*) in the *Governour*, requires the pupil to be taught geography, to prepare him for understanding histories. He is an enthusiastic believer in the value of pictures, plans, and maps, and insists that cosmography is a necessary study for "all noble men." In 1560 Laurence Humphrey (*q.v.*) in the *Nobles*, speaks of geography as a study that brings "great delight and profit." In 1622 Henry Peacham (*q.v.*) in his *Compleat Gentleman* recommends cosmography as a "science at once feeding both the eye and mind with such incredible variety and profitable pleasure, that even the greatest kings and philosophers have bestowed the best part of their time in the contemplation thereof at home." (See GENTRY AND NOBLES, EDUCATION OF.) In the same year Robert Burton (*q.v.*), in his *Anatomy of Melancholy*, speaks of the pleasure in studying geographical maps and praises those of Ortelius, Mercator, Hondius. His bibliographical list of geographical books includes: books of cities by Braunus and Hogenbergius; descriptive works by Maginus, Muster, Herrera, Laet. Merula, Boterus, Leander, Albertus, Camden, Leo Afer, Adricomius, Nic. Gerbelius, etc.; the famous expeditions of Christopher Columbus, Amerigo Vespucci, Marcus Polus, the Venetian, Lod. Vertomannus, Aloysius Cadamustus, etc. He goes on to enumerate the accurate diaries of Portugals, Hollanders, of Bartison, Oliver à Nort, etc.; Hakluyt's *Voyages*, Peter Martyr's *Decades*, Benzo, Lerius, Linschoten's *Relations*, those *Hodœporicons* of Jod. à Meggen, Brocard the Monk, Bredenbachius, Jo. Dublinius, Sandys, etc., to Jerusalem, Egypt, and other remote places of the world. Then he names the Itineraries of Paulus Hentzner, Jodocus Sincerus, Dux Polonus, etc. — with the reading of Bellonius, *Observations*, P. Gillius' *Surveys*. He then refers to "those parts of America set out, and curiously cut in pictures by Fratres a Bey." Such a list as that of Burton shows the vast development of geographical literature by 1622, one hundred and thirty years after the discovery of America. Among other prominent advocates of the teaching of geography in schools were Comenius (*q.v.*) in the *Great Didactic*, Milton (*q.v.*) in the *Tractate*, and Locke in *Thoughts concerning Education*.

The development of geographical theory might be illustrated by a comparison of the first modern geography in England, viz. the *Cosmographical Glasse*, 1559, a very creditable first production, and the *Geography* of Nathaniel Carpenter (*q.v.*), fellow of Exeter College, Oxford, in 1625. In the latter work we have a comprehensive volume of mathematical geography in the first part, while in the second part the connections of geography are carefully traced in other realms of inquiry, and the idea of "human" geography is almost as clearly grasped as in a present-day treatise.

Peter Heylyn had published in 1621 his *Microcosmus, or a Little Description of the Great World.* After spending over thirty years of further work, he produced in 1652 his *Cosmographie, containing the Chorography and History of the whole World and all the principal Kingdoms, Provinces, Seas and Isles thereof.* This is a thick folio, with 1100 well printed, matterful pages, a handsome volume full of history and geography for all the known parts of the world. It takes up almost every phase of geography, in profuse detail. It appeals to those who wish to read the Holy Scriptures by its sacred geography, to astronomers, to physicians (who may learn from geography the different tempers of men's bodies according to the climes they live in), to statesmen, to merchants, mariners, and soldiers. Cosmography, with Heylyn, includes natural and civil history, descriptive geography, and mathematical geography. The frequency of reprints of this huge and costly folio, well supplied with maps and illustrations, shows the vogue of the subject, especially when we bear in mind the costliness of production and the leisure required for reading it. It is a *gentleman's* book; geography was particularly a gentleman's study, and the reprints of Heylyn in 1657, 1662, 1666, 1670, 1674?, 1677, 1682, 1703, are an indication of the enormous development of the class of "gentlemen" in Tudor and Stuart times.

Returning to the advocates of the teaching of geography, J. A. Comenius in his *Great Didactic*, written about 1631, includes in the curriculum of the vernacular school "the most important facts in cosmography, such as the spherical shape of the heavens, the globular shape of the earth suspended in their midst, the tides of the ocean, the shapes of seas, the courses of rivers, the principal divisions of the earth, and the chief kingdoms of Europe; but in particular, the cities, mountains, rivers, and other remarkable features of their own country."

Sir William Petty (*q.v.*) in 1647 suggested that in the equipment of his *Gymnasium mechanicum* there should be the fairest globes and geographical maps, "and he wished the institution to be an epitome and abstract of the whole world." In 1649 George Snell in his *Right Teaching of Useful Knowledge* directed that the pupils in the English School should study the "excellent art of cosmography" and "delightful use of topography" and in 1650, John Dury (*q.v.*) in his *Reformed School*, suggested that an outline of geography ought to be taught in schools. In 1660, in the *New Discovery of the old Art of Teaching Schools*, Charles Hoole suggested that "in the uppermost story of the school there should be a fair, pleasant gallery wherein to hang maps and set globes, and to lay up such varieties as can be gotten in presses or drawers, that the scholars may know them."

Of actual geography teaching in academic institutions in England the first record naturally enough is that of Richard Hakluyt (*q.v.*) who claimed that he was "the first to show the new lately reformed maps, globes, spheres, and other instruments of this art for demonstration in the common schools." It must be observed, however, that though Hakluyt claims to be the first teacher of modern geography in England, yet in the ordinances of Shrewsbury School, drawn up in 1571 by the bailiffs of the town, provision is made that "from the stock remnant there should be provided a library and gallery furnished with all manner of books, mappes, spheres, instruments of astronomy, and other things appertayning to learning," and in 1596 the school had obtained "Mullinax his territorial globe in a frame with a standing base covered with greenish buckram." In 1597 the statutes of Blackburn grammar school state explicitly that "the principles of arithmetic, geometry, and cosmography, with some introduction into the spheres are profitable." In Laud's transcript of the studies of Westminster School 1621–1628 in the IVth and VIIth Forms: "After supper (in summer time) they were called to the Master Chamber (specially those of the VIIth Form) and there instructed out of Hunter's [*i.e.* Honter's] *Cosmographie* and practised to describe and find out cities and countries in the mappes." This was the *Cosmographie* (in Latin) of John Honter, which contained textbook, atlas, and index. Instruction was probably given at Winchester College in geography, for in the Bursar's book for 1656–1657 is the item £1.17.6 for a *Mappa Mundi.* It is probable that in all these cases the systematic geography taught was that of ancient Greece and Italy, as illustrative and elucidatory of the classical authors, and for composition writing in Latin prose and verse.

It is not improbable that some schoolmasters outside of the systematic curriculum may have been interested in and taught geography, as, for instance, John Langley (*q.v.*), head master of St. Paul's School, who is described as a "historian cosmographer and antiquary"; William Camden (*q.v.*), whose topographical knowledge of England was unique, head master of Westminster School; Thomas Farnaby (*q.v.*), master of the largest private school in England in the first half of the seventeenth century, who had in 1595 accompanied Sir Francis Drake on his last voyage.

Outside the schools, Hakluyt has already been mentioned at Oxford. In 1654 John Webster (*Examination of Academies*) says that in the universities geography, hydrography, chorography, and topography were usually taught, and he names the textbook used as that of Nathaniel Carpenter, but this was probably the mathematical part, rather astronomical than geographical. The projectors of academies, Sir Humphrey Gilbert (*q.v.*), in 1572, Sir Francis Kinaston (*q.v.*), in 1635, and Sir Balthasar Gerbier (*q.v.*), in 1648, all included cosmography as part of the proposed curriculum.

With the great advance of maritime discoveries and with the constant emigrations to New England, a great naval service arose, and the preparation of youths in so much of geography as pertains to navigation became necessary. Boys were apprenticed in large numbers to sea captains, serving especially in the Indian navy. In 1673 the Mathematical School in Christ's Hospital was founded with a view to preparing boys directly for sea service, in such subjects as mathematics, navigation, etc. According to the King's ordinance the Governors were to furnish the necessary "Books, Globes, Mappes, and other Mathematical instruments." At sixteen years of age or before, if the master of Trinity House saw fit, the boys were to be bound apprentice for seven years to the captain of some ship in the royal or merchant service. In 1681 the navigation class book was issued. It was written mainly by Sir Jonas Moore, assisted by the famous Flamsteed and Halley. It was entitled *A New Systeme of the Mathematicks* and contained sections on mathematical subjects, as well as cosmography, navigation, the doctrine of the sphere, astronomical tables, and geography. The latter is described as a "description of the most eminent countries and coasts of the world, with maps of them and tables of their latitude and longitude." The geography thus was prevailingly mathematical, and it is interesting to note that one of the Governors of the School, and a member of the Committee at the Visitation of 1697 was Sir Isaac Newton. Many public schools arose throughout the country in imitation of the Mathematical School of Christ's Hospital and not a few private schools, where navigation received special attention.

In 1674 Joseph Moxon, hydrographer to the King, published the third edition of his *Tutor to Astronomy and Geography*, dedicated to Samuel Pepys, "not as what you need . . . but what may prove an ease to your memory." Though the official hydrographer, Moxon introduces a section on astrological problems. The geographical section is certainly mathematical.

Geography was taught, curiously enough, by foreign language masters. Thus Guy Miége (*q.v.*) in 1678 describes himself as professor of the French language and of geography. He speaks of geography as a subject becoming a young gentleman, and says he doubts not the subject "will take root amongst the nobility and gentry of England as it hath in other nations; *especially since the war began,*" and he offers to teach geography either in French or in English. In 1682 he wrote a *New Cosmography or Survey of the Whole World.* Similarly in 1769, M. Jacques de Lavaud was a teacher of languages and of geography. It seems likely, therefore, that both French and geography received stimulus in their teaching from the Huguenot influence in England.

In the eighteenth century the development of the chronometer introduced more exactitude — in the fixing of the position of distant places. Surveys of coast lines and interiors become more exact, and measurements of the earth more reliable.

In 1729, the Fishmongers' Company in London presented their grammar school at Holt, in Norfolk, with "a valuable and useful library, not only of the best editions of the Classics and Lexicographers, but also with some books of Antiquities, Chronology, and *Geography, together with a suitable pair of globes.*"

In the century which intervened between Locke and Vicesimus Knox (*q.v.*) geography in England received attention practically as well as theoretically. This was particularly the case in private schools rather than in the public schools of England. Thus John Randall, who conducted a school at Heath, near Wakefield, in 1744, and afterwards removed to a school at York in 1765, wrote a "system" of geography, a comprehensive dissertation on the creation and various phenomena of "the terraqueous globe," as it consists of "subterraneous waters, mountains, valleys, plains, and rivers," with an hypothesis concerning their causes. It further contains a description of all the empires, kingdoms, etc., of the world, drawn from ancient and modern history, and some of the most celebrated voyages and travels. Statistics are comprehensively given of the "present state" of the various countries and full details offered as to climate, government, laws, policy, trade, revenues, forces, curiosities, population, character, religion, customs, ceremonies. In 1753 another private schoolmaster, J. Burgh, recommends in the study of geography the following textbooks: Randall's *System of Geography;* Harris *On the Use of the Globe;* the *Geographical Dictionary;* Anson's *Voyages*, and Salmon's *Geographical Grammar.* Of this list, Harris's *Geography* was the book of longest and widest vogue on the subject. The second edition is dated 1712. It proceeds by question and answer, and it is the first school textbook (apparently) of purely descriptive geography, and distinctly an interesting and helpful book for the learner. In 1746 was published the third edition of an *Introduction to Geography* on the same lines as that of Harris, written by J. Cowley, "geographer to his Majesty," a work which is apparently the first general modern geography explicitly stated to be "designed for the use of schools." These textbooks of Harris, Cowley, and Randall are more modern in scope and outlook than the later *Guides to the Use of the Globes,* the series beginning with that of Daniel Fenning in 1760, and continuing to the more matterful and interesting *Exercises on the Globe* of William Butler in 1814, designed "for the use of young ladies." At the beginning of the nineteenth century, the use of the globe was an acknowledged part of the curriculum of all the private schools and academies for young gentlemen and young ladies, although the teaching was mainly informational, and had little mental discipline in it.

Two points especially should be noted in tracing the history of geography teaching. First, its development has taken place outside of the recognized public schools system, chiefly in private schools. Second, arising in the mixed subject of cosmography it has become differentiated as earth knowledge, and its original partner, astronomy, in the portions which have especial reference to our earth, curiously enough, and not altogether advantageously, has been ousted from the study, even in outline, of the great masses of (at any rate) British children. In the teaching of geography itself, however, within the last decade modern aims and methods have improved almost more remarkably perhaps than in any single subject in England. F. W.

Academic Status. — *Germany.* — Geography as a university subject has long had a prominent place in Germany. A long list of eminent names attests to the high position of this science in a nation noted for its scientific achievement. Humboldt, Ritter, Ratzel, and Richtofen stand out prominently among the great geographers that the world has produced; and in the German universities of to-day are included some of the leading geographers of the present time. Geography is a recognized and essential part of the university curriculum, and provision is usually made for the presentation of various phases of the subject by two or more specialists in different parts of the geographic field.

The prominence attained by geography in Germany is the result of a variety of causes, among which is undoubtedly the strong influence of a few powerful men, early in the field, working in a country where centralized authority has had a voice in university development. Doubtless also it is partly due to that keen, clear-sighted recognition of the value of science, in all its phases, which has placed Germany in the front rank in science and has been one of the chief underlying causes for the wonderful industrial development of that country. The scientific spirit, so noticeable throughout the German nation, has encouraged geographical research, thus providing teachers; and where there are inspiring teachers and leaders in research, there are certain to come students to listen and to investigate. There are certainly two other prominent factors which help to explain the importance of geography in the universities of that country. One of these is the broad intellectual interest of the normal, educated German; the other is the nature of the educational system. Under more or less complete centralized authority a curriculum below the university has been developed in which systematic study of scientific geography has a definite and prominent place. And since the German teacher must know the subject he professes to teach, provision is made in the universities to meet the demand. Further, the breadth of culture among educated Germans is such that it is fully recognized by them that geography is a basal science, an understanding of which is essential to correct interpretation of much of human history and development; and that it is also basal to an appreciation of the distribution of animals and plants and to the industries that depend upon them and upon other products of the earth. Thus it happens that many German students, whose main interest is in other lines, seek a knowledge of scientific geography such as the German university professor can give.

Partly as a result of German influence, geography has now a high place in other continental nations; and what has been said with regard to geography in Germany applies to a greater or less degree to Holland, Switzerland, Austria-Hungary, and France. But in Europe it is almost warranted to state that the importance of geography as a university subject diminishes progressively with the increase in distance from Germany.

England. — It is a curious fact that in the one nation where the strongest reason for geographic interest would seem to be present — the British — university geography is almost at its lowest ebb. Only within a very few years has any provision whatsoever been made for geography in the great British universities, and then merely in a sort of experimental way in the form of lectureships and readerships, urged and partly supported by geographical societies.

No. attempt will be made to consider the question whether the striking contrast between Great Britain and Germany in this respect is in any way ascribable to a difference in scientific spirit or broad scientific culture. There are other more evident and more easily demonstrable causes. One of these is the fact that there is no such centralized educational system below the university; and in the schools geography has no such rank as in Germany. There is, therefore, no such demand for teachers with a university training in geography. A second reason is that the British geologist has taken into his own field some of the best of scientific geography. Therefore some of the most important geographic work published in Great Britain is from the pens of geologists, and is produced as a kind of geological by-product. A third reason for the position of geography in Great Britain, perhaps the result of its world-wide colonial interests, is the fact that geography there has come to be considered as almost synonymous with exploration. A journey to the Arctic or the Antarctic, a trip across Africa, or an exploration of New Guinea is ranked as more geographical (if we may judge by honors conferred) than an interpretation of a land form, or a scientific study of the geographical relationships of a known area. Geographical publications abound in interesting descriptions of remote regions, little known people, itineraries of journeys, and associated incidents, accidents, and adventures. Such exploratory work while doubtless important, as the accounts certainly are interesting and entertaining, rarely merits the characterization scientific, and is not uncommonly even distinctly unscientific. There is certainly little basis for a subject of this sort to claim a place in the university; and it is by no means improbable that the reputation gained by geography as an essential synonym of exploration is one of the strong reasons why geography has so tardily won a place in the British universities.

Lest this characterization of geography in Great Britain be misunderstood, it may be well to add that there have been scientific geographers of the very first rank. Such names as Lyell, Wallace, and Geikie rank with the world leaders in scientific geography; but they are not, as in Germany, university teachers. The beginning that has been made, notably in the Oxford and Cambridge Schools of Geography, has been admirable and is promising for the future, while the newer universities have also made provision for the higher study of the subject in connection with economics and commercial courses.

United States. — In America the recognition of geography in the university has been almost as tardy as in England, and for similar reasons. There have been cases where professors of history or of political science, usually with a German university experience, have given brief courses in historical or political or commercial geography to furnish a part of the geographic basis needed by their students. There have been a few cases where chairs of geography were established a generation or more ago; but these instances have been sporadic and have represented no well defined movement toward university recognition of geography.

Perhaps the nearest approach to early recognition of this subject in the university curriculum in the German way was when Guyot (*q.v.*) was given a chair in Princeton. Agassiz (*q.v.*) found the American field a virgin one for the introduction of scientific natural history from its European environment; and with his genius, personality, and boundless enthusiasm he laid a foundation upon which the growth of natural history subjects in the American university became assured. Seemingly equal opportunity existed in the field of geography, and to it Guyot came at Agassiz' suggestion and in 1854 became professor of geography at Princeton, a position which he held until his death thirty years later. Guyot did valuable and important work, but apparently conditions in America were not favorable to vigorous spread of scientific geography; there arose no effective Guyot School and geography in the American university had about the same position at the end of his teaching as at the beginning.

In the meantime, the study of geology (*q.v.*) spread rapidly, and provision is now made for it in every college, while the larger universities have from three to five professors for the subject. This high rank of geology is apparently due in part to the recognized scientific character of geologic study, and in part to the presence of a demand for men with geological training. Geography, on the other hand, has had in America, as in Great Britain, to bear the reputation of being non-scientific, or, at best, little more than a descriptive science. At the same time some of the most thoroughly scientific phases of geography have been annexed by sister subjects, notably by geology. As a result of the confusion thus arising, there has even been a tendency to question whether there is a science of geography, some holding that all that is really scientific in it lies within the province of established subjects, such as geology, zoölogy, botany, ethnology, history, economics, etc. It is sufficient answer to such a claim to point to the scientific results of continental geographic research, and to the contrast in output on such topics between Germany and England or America, where geography is not so organized as a science.

As in Great Britain, so in America, there has recently come about a change in the status of geography in the university; but the nature and underlying causes of the change have been quite different in the two countries. In Great Britain geography has gone into the university as a result of outside pressure; in the United States it has evolved within the university, primarily as a result of the discovery that much that had previously masqueraded under the term "geology" was really geography, or needed only moderate change to enrich it with the true geographic flavor. Naturally this geography, of geological parentage, is dominantly physical geography or physiography. That it should have made for itself a place in American universities as an offshoot of geological teaching is natural when it is remembered that some of the most significant basal principles of the evolution of land forms have been discovered by American geologists as a by-product of their geological work, — notably by Gilbert and Powell.

To Davis of Harvard, more than to any other one person, is to be credited the evolution of the geographic phase out of the geologic teaching, and its segregation into a more or less definite branch of science teaching in the American university. Other teachers were, and still are, teaching geography as geology, and some have definitely recognized the fact, — for instance Shaler of Harvard, who in a large part of his broad scientific interest was a real geographer, though he ranked in the university as professor of geology. Having introduced the geographic viewpoint into his teaching as a member of the Harvard Geological Department, and working in the midst of the inspiring influence of his geographic colleague Shaler, Davis has developed an American school of physical geography whose influence has spread throughout the whole field of American education. A generation of physiographers has been reared by the genius and tireless energy of Davis, and, as in the case of Agassiz in natural history, the extent of the influence of the master has been broadened by the work of his pupils and by others less recognizably under his direct influence.

But this peculiar manner in which geography has found a place in the American university has resulted in its occupying a rather anomalous and somewhat narrow position in the curriculum. Ordinarily geography is merely a part of the course offered by the geological department, and the teacher of it may rank as professor of geology, as in fact is the case with Professor Davis himself, who is not professor of geography in Harvard, but Sturgis- Hooper Professor of Geology. In some of the better universities and colleges no provision whatsoever is made for any geography excepting such elementary instruction in physical geography as a professor of geology can give in addition to his purely geological teaching. In such cases there is little basis or opportunity for geographic research. A still larger number of the leading universities have one or more men who give their entire attention to geographic subjects in teaching and research; and a few make special provision for other phases of geography than physical geography. Yet, with but few exceptions, this geographic work is offered in the geological department, or in the department of "geology and geography." In a very few cases geography stands as an independent department coördinate with geology, from which it has in most instances been recently divorced.

The evolution of geographic instruction in the American university, in the main on the basis of previous university recognition of geology, has been extraordinarily rapid in the last ten or fifteen years, during which most of it has taken place. Whether similar development will continue for another decade cannot be told; but it is clearly evident that geography has at last gained a position in the American university curriculum from which there can be no recession. Three or four of the larger universities have set an example of broad policy, recognizing geography fully and providing for the teaching of a number of its important phases, as in Germany. Others, also among the leading universities, have scarcely taken the first step; but it is to be confidently expected that these laggards will not long remain so far behind. The example so long ago set by Germany, and now fully adopted by a few of the more progressive American universities, may fairly be considered the goal toward which the best of our universities will tend.

It is to be noted, however, that scientific geography in the American university is at a disadvantage as compared to its position in Germany. It is not to be expected that university trustees will provide teachers in subjects not demanded by students, nor can they properly make much further provision for the expansion of elementary instruction. To the German university there come students with previous good training in geography, much of it on a par with some of our elementary university geography. There is also a body of earnest students who in their desire to master special subjects correspond more nearly with our small group of graduate students than with our overwhelming numbers of undergraduates. These students are not content with mere elementary work, even though their main interest lies in history or in botany. The point to be noted here is that the teacher of geography in the American university may be obliged to justify his appointment more in elementary courses than in advanced study, — and an examination of some of the courses offered seems to indicate that this is the real condition. If so, we may not hope for the great scientific result in America that recognition of geography in the university has brought in Germany.

Finally, there is the difference in the utilitarian influence in Germany and in the United States. There a demand exists for men and women trained in geography before they are allowed to teach geography. Here pedagogy is not commonly placed ahead of knowledge. The principle that " a person can teach anything if only he is a natural teacher " finds far less encouragement in Germany than in America. Only in our larger cities, and in not all of these, is knowledge ranked with pedagogical power. Moreover, almost equally with England, geography as a school subject is neglected in the United States. A student in his most immature period has a few years of geography study; then comes an intermission, then perhaps a course in physical geography or commercial geography, or possibly no geography at all. The high school geography may be given to almost any one, very likely to the least burdened teacher, possibly of drawing, or Latin, or English. For those who plan to be teachers there is little need of studying university geography. This contrasts strikingly with Germany, where there is a well devised course of geography in the schools, and where a geography teacher is supposed to know geography.

The condition in America undoubtedly has had, and still has, a very important influence in retarding the development of geography teaching in our universities. It will continue to be a disadvantage as compared with the conditions in Germany; but there is another phase which is hopeful. With the development of geography in the university curriculum there will doubtless spread an influence down through the grades as a result of which the teaching of the subject will be both extended and improved. Perhaps one of the greatest reasons for the weakness of our school geography is the fact that the subject has not hitherto found adequate recognition in the American university. R. S. T.

University Courses. — In Germany the offerings in geography vary with each semester. For example, there were in the winter semester of 1910–1911 seven courses at Berlin; one at Halle (on Arabian geographies); one at Heidelberg; five at Leipzig.

In the English universities the advance in the study of geography has been due in the main to the development of commercial courses in the newer institutions. At Oxford a School of Geography was established in 1899 with the aid of the Royal Geographical Society, and has a faculty consisting of the University Professor in Geography, an assistant, and lecturers in ancient geography, and the history of geography, an instructor in surveying, and a demonstrator in geography. Diplomas and certificates are awarded in the subject. At Cambridge a Board of Geographical Studies, working in conjunction with the Royal Geographical Society, exists to promote geographical research and study and to arrange courses. There are a University Reader and lecturers in geography. The subject may be offered for the ordinary B.A. degree, the examination covering physical, historical and political, economic and commercial geography, cartography, history of discovery, and elements of ethnology. Diplomas are also awarded by the Board of Geographical Studies. At the University of Manchester courses are given in the faculty of arts by the lecturer in geography in the scope and meaning of geography, in geography of a special area, political and economic geography; and a practical course and a seminar are conducted, while physical geography is given in the faculty of science together with geology. At the University of Liverpool courses are given by two lecturers in classical geography, general principles, physiography, commercial, historical, and regional geography.

The development of the subject in America has already been dealt with. Here a few courses and number of instructors in the subject will be given from a few representative universities.

Harvard. — Professor, assistant professor, and an assistant. For undergraduates: Physical Geography — lectures, laboratory work, and field excursions. For graduates and undergraduates: Physiography of the United States; Geographic Influences in North America; Physiography of Europe; Geomorphology; Geography of South America; and (for graduates primarily) a research course in Physiography.

Yale. — Professor and two assistant professors. Undergraduates: Physical and Commercial Geography followed by environmental influences on man's activities; Anthropography; Physiography. Graduates: Physical Geography; Geography of North America, South America, and Asia.

University of California. — Three assistant professors and one instructor. Lower Division: General physical geography; Introduction to Economic geography; the materials of commerce; Introductory geography; Physiography of the lands; Topography maps and models; Relief modeling; Elementary meteorology; Geography of Spanish America; Historical geography (two courses). Upper Division: Historical geography of Modern Europe; Economic geography of the United States; General climatology; Oceanography; California map; Geography of North America; Geographical influences in the Western United States; Climatology of the Pacific Coast; Glacial geography; Geography of California; Geography of Africa. Graduate Courses: Physiography of the Pacific Coast; the teaching of physical geography; Special studies in physiography and climate; Commercial resources of the Spanish-American Countries.

Chicago. — Professor, two associate professors, and an assistant. Undergraduate: Commercial geography; Economic geography; Climatology; Influence of Geography on American history; Political geography; Climate and man; Economic geography of North America; Economic geography of Europe. Senior and Graduate: Commercial geography; Economic geography of tropical countries; Principles of geography; the geographic problems of the Orient; Cartography and graphics; the historical geography of American cities; the natural resources of the United States, their exploitation and conservation; some principles of Anthropogeography; geographic influences in the history of New England; of the Interior; of the Middle Atlantic States; History of Geography; Research courses. Courses in physical geography are given in the Department of Geology.

University of Wisconsin. — Given in the Department of Geology. Undergraduate: Short course in geography; Physiography and geography; Physical geography for commerce students; Economic geography; Regional geography.

University of Pennsylvania. — Given in the Department of Economics. Undergraduate: Political geography; Economic climatology; Geography of Europe.

Geography in the Schools. — *United States.* — Geography has long held an important place in school work in the United States, both in elementary and in secondary schools. Geography has at times been considered by some to be the fundamental subject in elementary schools, about which all other subjects must center (see CONCENTRATION; PARKER, FRANCIS); by others, geography has been and still is considered a catch-all subject which has little inherent strength of its own, but yet must be given some place. By others, and the number is constantly increasing, geography is held to be one of the fundamental subjects of the curriculum, tested as to its worth and capable of being developed by good teaching into one of the most significant of school subjects. Geography as the study of the earth in its relation to man deals with elements of the environment of deep significance to all, and is of great value because of the aid it gives to other subjects in the curriculum.

Geography is no longer generally considered merely an informational subject which permits some attention to necessary, detailed facts to be known by all. Although facts are vital and necessary in the subject, geography, as a study of relations between the physical environment and life in a causal way, is decidedly a study of principles of great working significance. Geography, rightly taught, imparts to the pupils a knowledge of large relations over the world, which all must know to understand current events, world-movements of people, or the problems of commerce of to-day. Geography teaching, therefore, has for its purposes the imparting of a working knowledge of the principles of geography and training in working with geographic relationships and geographic materials that gives pupils a power to use their knowledge in later life. This viewpoint is fundamental and vital in both elementary and secondary school geography, but as yet secondary school geography is so specialized that these larger purposes are often lost sight of in the endeavor to give training in specialized, scientific thinking in a narrow phase of geography.

Elementary School Geography. — The character of school courses in geography is now, as it always has been, largely determined by the content of the textbooks in use. In the earlier part of the last century, the school texts were topical in order and were planned to cover the geography of the world in a brief way. Later, the geography course was represented by two books, an elementary and an advanced, or a first and second book, and that plan holds to-day. The plan of the earlier book was to present the larger, more general items of geographic interest, to be followed in the larger book by a more broad consideration of the same topics. These books dealt largely with the facts of political and of physical geography and gave little attention to geographical relationships.

The first departure from the earlier plan was in the Guyot Geographies of 1866, in which emphasis was given to human relations to physical conditions, and in which maps were made of vital significance. Guyot's books were, however, ahead of their time, and the principles of Guyot, now recognized as of great significance, were but little developed by others. (See GUYOT.)

The first great change from the plan of these earlier books was in 1894, following the *Report of the Committee of Ten* (*q.v.*) of the National Educational Association. Owing to a renewed interest in physical geography, and to a recognition of the importance of observational work in geography, much emphasis was given to physical geography in all phases of school work. The first geographies which appeared after this *Report* gave a new impetus to school geography and introduced an era of progress of great significance. Although these early books placed great emphasis on physical geography, they did not ignore the life side. The new ideas were grafted on to the old without supplanting it to any great extent. They proved the importance of thought work as against memory work in geography, and since that time the endeavor has constantly been to make geography more real, more vital, and more thought-provoking to pupils.

The recognition of the well-founded educational principle that pupils' work must be based on previous knowledge in all fields of study, has led in the last decade to the inclusion of home geography as the fundamental phase of school geography work. Home geography is planned to help children in organizing their everyday experiences and to see the simpler relationships of life to its physical environment illustrated in every locality. Simple generalizations, based on these local studies, lay a foundation for extending the children's work so as to include the world whole, which forms generally the second stage in school geography work. The development of the simpler ideas of the world as a globe, and of the distribution of the continents over the world, gives a background for the earlier study of certain of the continents and countries of the world, through maps, pictures, and text. Usually these earlier phases of geography are followed through the fourth, fifth, and a part of the sixth year of school life, up to the time when many pupils leave school.

In the later years the continents, or certain of them, are again studied from a somewhat different standpoint through the sixth and seventh years. This advanced continental work, in which much attention is given to commercial geography, is usually preceded by a study of certain of the principles of mathematical and physical geography, to lay a foundation for a careful causal continental study. In other cases, this work is placed as the climax of the course as a specialized phase of geography. In a few instances, geography, as an all-round subject, is closed in the sixth year. The geography of the later years is very specialized and is devoted to the commercial and industrial aspects.

In by far the greater number of large cities in the country, geography is taught from the fourth to the seventh years inclusive, though there is an increasing tendency to restrict geography work to three or to three and a half years. By far the larger proportion of the time devoted to the subject is given to the study of the regions of the world, since political geography, as it is often called, forms the larger phase of geography that pupils come in contact with in after life. This regional work naturally includes the study of physical and commercial conditions as well as of political conditions, and involves mucn study and training in the use of maps as well as of text and supplementary materials. Such a course of study is generally followed throughout the country, according to the plan of the texts in use. In an increasing number of places the course of study is now specially planned to meet local needs, and hence the order of treatment of topics and phases of the subject may vary extensively. In by far too many localities, however, the text forms the only course of study used and the yearly programs are measured in pages of the text.

There has been great progress in school geography teaching in the last few years. Better texts, better maps, better trained teachers, improved training courses in normal schools and some colleges, and a larger supply of valuable and accurate supplementary volumes have all contributed to the improvement of the subject. The greatest weakness in the field at the present time is a lack of first-class wall maps and a dearth of reasonable-priced, accurate school atlases. In these mechanical attributes of good geography teaching, the United States is far in the rear as compared with Germany, France, the United Kingdom, or even with a small country like Switzerland.

The history of the development of elementary school geography in this country has shown that progress has always been made through evolution and not by revolutions in content or plan. It is not likely that the general content of elementary school work in geography, the outgrowth of generations of experience, will be overturned in the future. As old subjects are tested by modern scientific methods and found wanting, they will be replaced by more rational and vital topics. Much progress has been made in eliminating from school work topics in geography that are not pertinent to the needs of pupils, and which are too adult for school use. A conservative public will, however, permit such changes to be made only slowly, while the demand that all that is new and perhaps of little value should be included, is widespread and insistent. The great problem for the future is the judicious modification of the course under the expert guidance of trained and interested geographers and leaders in modern education.

Secondary School Geography. — Secondary school geography in general falls into three categories, according to whether the work is presented in the earlier or later years of the course. Physical geography is the favored phase of geography in secondary schools and receives the greatest attention in the first or second year of the course. In many schools, particularly those preparing pupils for college entrance examinations, an advanced type of physical geography or physiography, as it is often termed, has a place in the later years of the course. Until within recent years, physical geography has been given a place in secondary schools because of its informational value, and its content was determined from that standpoint. As thus presented, it had no unity and little value as a science. The development of physical geography by American workers in field and classroom has shown the subject to be rich and full as a cultural and scientific study. In consequence, the pendulum has swung away from the older informational subject toward a newer, rationally organized physical geography.

It is now generally recognized that enthusiasm for the newer point of view has carried us to extremes, and that physical geography as such has received an undue proportion of the time that can be given to earth science in secondary schools. If the task of the secondary school is to prepare pupils for after-school life, then obviously the content of geography and other subjects must to some extent be determined by the conditions in the adult world. In these modern days, pupils are going to be confronted in the business world with commercial conditions, and through the press they will constantly be brought in touch with the general geographic conditions of the great nations of the world. The development of modern commerce has, since about 1900, caused an ever increasing attention to be devoted to commercial geography in secondary schools. As a rule, this needed phase of the work has been organized with little attention to its relations to physical geography. Like the latter work, commercial geography is found prominent in both the earlier and later years of the course. The rapid development of commercial geography is indicated by the fact that, while but one book was available for secondary use in 1901, at least ten much-used books exist in 1911.

Commercial and physical geography are so closely related in a causal way that neither can well exist independently in a course of study. Hence the demand has arisen that these phases of the work be coördinated more closely in secondary schools. Two committees, one from the National Education Association in 1909, and the other from the Association of American Geographers in 1910, recommended that the one year to be devoted to geography in secondary schools be divided so that one half the time be given to the essentials of physical geography and one half to commercial and regional geography. This latter recommendation is based on the conviction that pupils ought to study the general geography of the United States and Europe, at least, in the high school, as a contribution to their general training and as a basis for efficient work in history, economics, botany, zoölogy, and other subjects that deal with facts of distribution. Physical geography as a college entrance subject has never held an important place in secondary schools, and is particularly developed in large public schools or in private secondary schools where funds are available for securing the necessarily inclusive and somewhat expensive laboratory equipment.

England. — School geography in England has progressed rapidly in the last few years; though in many ways it is still very unsatisfactory, as it is in America. The modern development of interest in geography, particularly in the higher schools, dates from 1886, when the classic report on geographic instruction was published by the Royal Geographical Society from the pen of Dr. J. Scott Keltie, who made a thorough and painstaking study of geography teaching in England and on the continent. In general, the plan of work advocated for the elementary schools of England is similar to that in America, though greater emphasis is given to physical geography in the several standards. The plan of beginning with local, observational geography and working out to the geography of the world, with a special study of selected countries in later years, is followed. A large number of improved textbooks and books on teaching makes effective work possible, and the work of the Geographical Association has done much to arouse teachers to a realization of the possibilities of geography.

In the secondary years much more attention is given to regional geography than in America, and physical geography, as such, has a distinctly subordinate place. The work is, therefore, well coördinated and definite, though its content is largely determined by the examinations set by the larger universities. The outlines in present use show great advances over those of 1885–1886, and indicate how far-reaching in its influence has been the establishment of geography as a university subject in the larger universities and colleges. Inspiration and guidance have come from the leaders in the higher fields of geography teaching and have caused a very significant revival of interest in school geography. Furthermore, the leading business men have realized that England as a commercial nation must give more attention to geography teaching in the schools.

France. — Geography in the schools of France runs in cycles, the climax of the two cycles being a study of France and its colonies. Beginners are led through an observational study of the local environment outward to the world whole. This is followed by a study of the continents, and is brought to a summary in the fourth school year in a study of France and its colonies. In the second cycle, which is completed in the eighth school year, the elements of physical geography are followed by a study of America, Australia, Asia, Africa, Europe, and again is brought to a climax in a more advanced treatment of France. This work is largely presented through excellent textbooks which order the content of the course in a definite way. In the secondary school the same idea of cycle is followed. In the first year the history of geography, physical geography, political and commercial geography, and a brief course in geology constitute the outline of work. This is followed in the second year by a special study of France in great detail, and the outlines of cosmography. The character of the geography work in the later years is determined by the special course of study followed by the pupils and is in no case complete or closely related to the earlier work. Thus geography teaching in the elementary and secondary schools of France is very largely political and regional geography, so arranged that pupils will, as the years pass, become increasingly familiar with the geography of their own country and its economic, political, and physical features.

Germany. — Probably in no country in the world is geography in schools so well organized and taught as in Germany. Teachers are trained for their work, and the supply of available books, atlases, and maps is without a parallel for quality, accuracy, and usefulness. Excursions have been developed generally as an important phase of school work, and geography is thus a matter of things and not of words or imaginary pictures, as is so frequently the case in America. The general order of the divisions of the course is similar to that in America. Following a study of the home surroundings by observation and of Germany comes a brief treatment of the several continents of the world. This is in turn followed by a study of the continents from the physical standpoint, in the years corresponding to our upper grammar grades. The climax of the work is a course in general geography with special emphasis on physical geography, and of political and commercial geography. As in America, greater emphasis is, in recent years, laid on commercial geography from a broad viewpoint. This plan, roughly outlined, differs little in general plan from that of many years ago. Progress is indicated by change of emphasis of details, rather than in any variation in the larger steps of the course. A pupil who completes the nine years of prescribed work in geography has a good knowledge of elementary geography in all its branches and has learned how to use his knowledge in the specialized later school work, with great profit to himself.

Methods of Teaching Geography. — Until within a few years geography teaching in American schools, both elementary and secondary, largely followed one method, — the pupils memorized the words of the textbook without, as a rule, any adequate comprehension of the meaning and significance of the material studied. Where maps were involved, these were studied in the same way. Pupils were encouraged to search maps to find obscure and well-known places, with no thought of giving them any training in the use of latitudes and longitudes. Thus they gained no assistance through the exercises that would have helped them to find other places by the same method. In recent years the character of geography teaching, in both elementary and secondary schools, has radically changed, although the old memoriter method still persists in many school systems where the teachers are not trained in modern methods or are out of sympathy with their tasks.

As the former method was characterized by memorizing, the new method is characterized by reasoning. The reasons for geographical facts are studied with the facts and through the facts, and the " casual notion," as it has been so aptly named, is the keynote of geography work. In this study of the relations between human geographic conditions and the underlying physical conditions, much use is made of maps, not merely as sources of information, but as valuable media for depicting geographic features of all kinds. Map hunting has given way largely to map reading, and pupils are taught to use a map as they would their texts, as one of the most valuable bases for study. In the specialized work in secondary schools, great emphasis is given to the map study of land forms, ocean conditions, climatic conditions, and to life geography. The new point of view in reference to geography work, and the realization that ability to work with geographical materials is of greater value than mere information, together with the recognition of the importance of making facts and principles real, has led to the introduction of laboratory work, particularly in secondary school geography. In some cases laboratory work merely consists of the desultory study of graphically presented facts, because the curriculum calls for laboratory work. Under these circumstances laboratory work is often an irrational phase of geography teaching, of little more real educational value than the busy work of the primary grades. In the better schools laboratory work, however, is a vital part of the study and is made the foundation in the first presentation of most new topics. The influence of laboratory work, which calls for the study of things and the graphic representation of things, has had a large effect upon the method of study in elementary schools, where observation of local phenomena, the study of land features, human relations, and industrial conditions, through excursions, together with the study of weather records and similar work in other fields, have become a vital supplement to map and text study.

Methods in Elementary Schools. — There are many different methods in vogue in elementary schools, either for portions of the course or for the course as a whole. In general, the best method is that which permits the individual teacher to make the best use of his personal powers in securing the progressive advancement of his pupils with the least waste of effort on their part. A skillful teacher makes use of many methods in various stages of the work and does not attempt to organize the course of study about some one plan of procedure. Among the various methods that are used sufficiently to be named, are the observational method, the journey method, the type method, the map-drawing method, the topical method, and the inductive method. Masters of each of these several plans of procedure can avoid the dangers and develop the strong features of their plans so that the progress of the pupils is secured; but mere followers of a plan, with perhaps little reserve knowledge and a narrow viewpoint, easily become the slaves rather than the masters of the method, and the pupils become the unfortunate victims of misguided enthusiasm.

The *observational method*, the study of things, obviously ought to be followed in school geography teaching at every opportunity, especially in the home geography work of the earlier grades and in the study of the atmosphere, land forms, and local industries. Modern education requires that all subjects be made real to pupils, and in no subject is this need greater than in geography. By emphasizing similarities or contrasts with local features, distant geographic conditions may be made real. This requires observational work at all times.

The *journey method*, whereby countries or portions of a country are studied in the order in which they would be seen in an imaginary journey, is obviously valuable at certain stages. Further, this plan of procedure is interesting to many imaginative children and permits the ready use of supplementary materials. The journey method followed blindly, however, does not readily permit the teaching of a country as a whole and the emphasizing of causal relations. This method, therefore, seems better adapted to the earlier than the later grades of a school course. Such a method of procedure causes knowledge to be related to steamship routes and railway lines, and not to be centered about political areas, as is generally necessary and advisable. It has a special value in the early study of the world whole, and to a certain extent in the later work with the commercial side of school geography.

The *type method* is found in use in various phases in American school geography work. According to this method, one section or area is studied very fully as a basis for comparison; and other areas, similar to the selected type, are passed over quickly. If the selected area is a political and physical unit, a lengthy study of the section may result in an overemphasis of minutiæ, so that the area does not stand out in the pupil's mind for its salient features. If the selected unit area is a section about which some human interest centers, and is not a political or physical unit in itself, it fails to be a geographic unit and hence is a poor basis for comparison. One weakness in the teaching by such types is that political areas are studied incidentally and perhaps are not clearly understood. Yet political areas are foundational in any use that is made of regional geography in everyday life. The great advantage of the type area is that it permits a careful study to be made of a few sections, so that pupils may get a real comprehension of the value of geography and so that it provokes natural reviews. The latter fact is the strongest argument for following the type method in certain sections of school work.

The *map-drawing method* is now but little used, though a generation ago it was much in vogue. Pupils, by this method, are taught to draw maps by a rule of thumb plan and are trained to visualize their products. For pupils who have a good power of visualization, this method has its value, provided the maps are drawn according to an understandable scale and on a projection that does not too much distort areas.

The *inductive method* has never been much employed in American schools, for the obvious reason that geography deals with many facts beyond the students' experience, and a real comprehension of these impersonal materials can be more readily imparted by a plan that consumes less time.

The *topical method* is generally followed in the upper grammar grades, though the title covers multitudes of sins, in places. The best use of the topical method is found in the later years of school life, when a causal order from causes to consequences can be followed so as to give training in right methods of working and thinking. The topical method in the lower grades generally leads to the blind memorizing of items of information and not to the development of pupils' powers of work.

As a matter of fact, the method followed should vary with the character of the topics under consideration, with the age and abilities of the pupils, and according to the training of the teacher. Pupils in the early years are interested in the life about them and should in general work out in a causal order from the human and life conditions to the underlying physical influences; in the upper grades, the causal order should in general be followed from causes to consequences. Any teacher, however, who at any time finds himself getting into a rut through too slavishly following one plan of procedure, should, for the sake of himself, his subject, and his pupils, at once vary the monotony by changing his method so as to arouse his pupils into activity.

In all school geography work the danger is that the subject will be presented in so fragmentary a way that all the life is taken out of it. The picturesque side of geography should not be neglected, although it should be subordinated to a well-considered plan of procedure. This side can be brought out best through a rational use of pictures, specimens, and supplementary reading. Obviously, the excursion should be an important part of school geography work in this country, as it long has been in many European countries. Public opinion must be trained, however, to the appreciation of the value of excursions, before they can be generally used in large school systems. School excursions (*q.v.*) are harder to conduct than class recitations, and, unless in the hands of a wise teacher, degenerate into picnics and are of little value.

One important phase of geography teaching deserves emphasis because it runs all through the grades and has been too much neglected in recent years; that is, training in location. Location is essential in geography, but it does not make up the whole subject, as was so largely the case in the days of "sailor geography," with its lists of capes and capitals. Places and features to be studied as to their location may be divided into three classes, which will be found a good working guide to all teachers. The first class would include those names which should be at the ready service of any intelligent person; class two would include those names which ought to be familiar to all through their school work, so that they can be readily found on a map; class three would include those names which are locally significant, but which are not of equal importance in other regions. By judging any name according to its relative importance, according to this grouping, any teacher may readily work out for himself his minimum of location which he will develop in his class.

Methods in Secondary Schools. — Modern methods in secondary school geography are characterized by an emphasis on laboratory work. In many of the larger public high schools of the country, specially arranged laboratories have been constructed and equipped with extensive collections of maps, models, diagrams, lantern slides, illustrations, and, in some cases, with specially devised apparatus for experimental work in the development of land forms. In schools where the commercial or industrial phase of geography is emphasized, collections showing industrial products and processes have proved most valuable equipment. The laboratory presentation of topics is sometimes preliminary to the textbook and class study; in the larger number of schools, where the program is rigid, the laboratory work is supplementary to the text and class work. This relation ought to vary with the subject under discussion, for obviously some topics cannot be presented half by laboratory methods and half by classroom methods, as would be implied where the subject has two class hours and a double laboratory period a week. Certain topics in geography, as the study of weather, climate, and land forms, can be more readily approached from the laboratory side than can topics dealing with the ocean or the distribution of plants and animals.

Laboratory work may be introductory to topics and consist of well thought out problems presented in some graphic form, or it may be illustrative so as to give definiteness to the class and text work. The excellent supply of maps from the Weather Bureau and the United States Geological Survey makes this work in certain subjects much more feasible than it was a few years ago. The lack of good laboratory materials in certain of the other fields has meant, in many cases, an overemphasis of the land features, so that, from text and laboratory, pupils have secured a warped point of view as to the relative value of the several phases of physical geography. Newer methods, better laboratory manuals, wider conceptions of the right content of geography in secondary schools, have all contributed toward the improvement of laboratory work. It is now conceded that laboratory work is supplementary to class and text work, and not coequal in importance at all stages of progress.

In some schools, where the conditions are favorable, field work is carried on for a few weeks during the year, but field work has not developed to the extent that was hoped, owing to the difficulties incident to field trips. Field exercises may roughly be classed in two groups: in the early part of the course pupils may profitably be taken afield for "field sight," — that is, to get a comprehensive view of a landscape, see its parts, the problems it presents in a physiographic and geographic way. Such field exercises form the basis for class and laboratory work in the closed season of winter. In the open spring season the field exercises may be really "field work," where pupils work out simple problems which have been previously approached through the laboratory and text. As yet, however, excursions have not won for themselves a place in either elementary or secondary school geography, and are little used except in the study of industrial geography through visits to manufacturing and distributing plant. (See EXCURSIONS, SCHOOL.)

Equipment for Teaching. — It goes without saying that in all geography teaching a good textbook is essential. More than one should be used, if possible. The market is now well supplied with good texts for most of the work of elementary and secondary schools. Laboratory guides, supplemental volumes for reference work, encyclopedias, and books of reference are adequate. The great lack is good wall maps, school atlases, and ample illustrative apparatus for elementary schools. The available equipment for secondary work is in some cases overrich, so that teachers have difficulty in selecting that which is most pertinent.

In elementary schools atlases are practically unknown, and wall maps are little seen and less used. Yet wall maps are of fundamental importance in school work. Every classroom above the third grade in elementary schools ought to have as a minimum map equipment a good Mercator map of the world, a political map of the United States, and maps of the continents to be studied in the respective grades. In the upper grades there should also be physical maps of the United States and Europe and political maps of all the continents, not only for use in geography, but in history, literature, and current events. Yet this minimum is rarely found except in the best schools in our larger city systems. Outline maps are also a most valuable adjunct to class work and are now available in cheap and reliable form. Pictures, lantern slides, stereographs, specimens illustrating products and industries, models, and government publications, in great variety, are now easily procurable. They form most valuable aids to geography study and should be used wherever possible, provided they are selected with care and are used, not for purposes of amusing or merely illustrating points, but as really definite parts of class work from which valuable lessons may be drawn in a clear-cut and illuminating way.

Many other valuable forms of equipment might be cited, but a small equipment chosen acording to a well-ordered plan and used carefully and systematically is better than a mass of unrelated material used just because it is available. The problem of how to use illustrative material profitably is more difficult than how to secure it. R. E. D.

See Visual Aids to Teaching.

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GEOLOGY. — Relationship to other fields. — Perhaps no science shares its field with other sciences to a greater degree than geology. As the science of the earth, it treats in its own special way subject matter that falls also to one or another of nearly all the sciences for treatment in their special ways. Obviously in its function as the history of the earth it becomes the province of geology to treat the collective results of innumerable agencies and processes that enter individually into the fields of other sciences.

If a survey of the whole field of science be taken to bring further into view the genetic relations of the several subjects of study, it will be seen that the history of the realm from which springs the realistic phase of education discloses two coördinate lines of evolution, each of which embraces a series of progressive steps. The one series includes (*a*) the coöperation of chemical and physical agents in the formation of minute integers leading up to molecules; (*b*) the combination of molecules in the formation of crystalloidal, colloidal, and amorphous aggregates; (*c*) the assembling of these into the lithosphere, the hydrosphere, and the atmosphere; (*d*) the coördination of these in the formation of the completed planet; (*e*) the correlation of this with kindred bodies into the solar system; and finally (*f*) the assembling of solar systems into the stellar galaxy. The other series embraces (*a*) the coöperation of organic agencies in forming and actuating individualized plasms; (*b*) the union or differentiation of these in the formation of more complex living organisms; (*c*) the development of a system of transmittal of organic acquisitions; (*d*) the initiation of reflex and sense action; (*e*) the development of a system of registry of sense experiences; (*f*) the development of sense action and mental registry into higher and higher derivatives, until finally (*g*) they merge into the declared forms of mental, moral, and social phenomena; in other words, into the very working ground of education itself. The word "finally" is intended here to mean only the last stage of human vision, not at all the ultimate in any sense. These two series run closely parallel to one another and are interdependent. They in themselves imply better than a long discussion the relations of earth studies to other studies. To the student of earth history in particular, the genetic connections of the two series are themselves the best expressions of the vital relations of the sciences and serve as the most reliable guide in interpreting and evaluating their educational functions. The natural paths for educational procedure, so far at least as genetic considerations have weight, lie up and down the historical lines, for these disclose the real places that have been taken by the participant factors in the natural order of things. In the details of a formal study there is a choice between starting with the more primitive and the more undifferentiated and thence working toward the more segregate and the more individual, and as an alternative, starting with the last stages, the end products for the time being, and working backwards along the lines of genesis toward the more primitive and the more undifferentiated, but in natural practice — with little doubt the best practice — both courses have been followed interchangeably and often in such close succession as to make the method a type of reversible mental action, an almost spontaneous gliding from antecedent to consequent and immediately back from consequent to antecedent, from parent to offspring and at once back from offspring to parent, and so up and down from one link of the genetic chain to another in either direction, as occasion offers.

It is of course fully recognized that when the historical or genetic factor has little instructional value, which is perhaps only true when it is unimportant to know how the subject or the state under study grows out of or grows into other subjects or other states, the educational process may play more freely to and fro across the lines of natural sequence or in neglect of them. It is of course recognized that underlying the whole web and woof of antecedents and consequents there are many factors common to several or to all lines of succession and these may be treated to advantage independently, artificially, or "abstractly" and precedence given to their own kinships of qualities rather than their genetic or historical relationships. This mode and the genetic mode are complementary and coördinate, not antagonistic or even competitive.

The Essential Factors of Earth Study. — The study of our dwelling place involves four main factors: (1) the study of the birth of the earth; (2) the study of its structure and composition, *i.e.* the earth's mechanism; (3) the study of the energies, organic as well as inorganic, that actuate it and the modes of their action, *i.e.* its processes and its dynamics; and (4) the successive interplay of these, *i.e.* its history. From the higher point of view of earth science neither of these factors by itself can yield the highest educational results, for neither leads the mind to all the essentials of a round view. In world study at least it is not enough to know the origin or the mechanism alone, nor the processes and energies alone; there must be a study of the actual workings and, for a rounded, guarded, balanced view, a study of the long chain of blended processes and results actually realized in history.

Historical. — *The Primitive Stages of Earth Study.* — In the primitive education of the various peoples, the crude products of earth study, if study it may be called, had a rather large place in the small total of educational agencies that took part in guiding the primitive ways of life. Such information as was picked up and handed down related chiefly to the immediate needs of life and may be said to have been forced by daily requirements rather than sought for the love of knowing. The additions that were slowly made as time went on more largely took the form of a widening of imperfect knowledge than of a careful sifting of what had been acquired. It is true that then as at all times testing by trial sifted, in some measure, what passed for knowledge, but it was incidental rather than purposeful, and the critical spirit of science was not yet born. The whole was very crude, yet it was very necessary. The primitive school of earth lore was the open school of life's necessities. It was indeed so broad that it was shared by many of the higher animals, each in its own peculiar way, and some of the attainments of these animals in the line of keen geographic sense and acute knowledge of local topography compel admiration.

The earth lore of the human race in these early stages was chiefly of the geographic rather than geologic type. (See GEOGRAPHY.) There was, however, some rude beginning of acquiring knowledge relative to crustal structure and composition. Caverns were explored and occupied; structural material was chosen and built into shelters and homes, stone was selected and fashioned into weapons and tools, certain ores were discovered and smelted, and the use of metals begun. A crude form of economic geology was thus slowly brought into being and took part in the rude training of the primitive races. There can be no doubt, also, that even the rudest peoples were impressed by earthquakes and volcanoes, by floods and landslides, and more or less by the gentler geological processes, but these impressions seem to have tended rather to weave themselves into fantastic conceptions than into sober inductions of the scientific order. While these beginnings of geologic knowledge can scarcely be classed as science, they cannot be disregarded as elements in the primitive education, for they were in reality germinal. At these early stages there does not seem to have been more than vague imaginings of what the earth as a whole might be, and such speculations as were indulged in respecting its origin were of the mythical anthropic order.

Throughout this primitive stage no other concept than that of a flat earth appears to have had any vogue; and so the belief that the earth was essentially a plain may be taken as the most tangible criterion to set off the primitive stage from the more advanced stage that followed it. It seems strange, and yet is perhaps not so strange as it seems, that the geographic dispersion of the race should have well-nigh wrapped the earth about, while yet the notion that it was flat prevailed. Even within historic times and among the Mediterranean nations of much lauded intellectual attainments it was regarded as a great step toward unity and completeness to be able to map the land as a circular or elliptical plain, girt about by the great river, Oceanus.

The Stage of Speculative Extension. — When the epoch of the flat earth, the earth of common vision, began to give place to the spheroidal earth, the earth of corrected vision and of scientific imagination, the unscientific imagination came also into play and a whole troop of visionary conceptions of modes of formation sprang into being. There was at first little restraint from chemical, physical, and astronomical knowledge, or from scientific training, and so fantastic speculation ran riot for a time. In this the pre-Grecian peoples indulged freely, while the idealistic trend of the Greek mind lent itself peculiarly to this indulgence. A long line of eminent Greeks drew in turn a varied series of pictures of earth genesis among which the metaphysical were dominant; but still these were stimulative and clustered about some substantial seeds of truth. As early as the sixth century B.C. Anaximander, doubtless working on germinal ideas derived from Thales, set forth his conception of a fluidal evolution of the earth and of the stars. He conceived the earth to be round, and set it in the center of the universe. Mystical as his view was in most respects, it recognized physical stages in cosmic development and was the germ of a new order of thought. In the same century Xenophanes noted the remains of mollusks and of plants imbedded in rocks and took a step toward fossil biology. This was scarcely a step in paleontology, even in embryonic paleontology, for Xenophanes seems to have had no thought of a series of ancient types leading up to the present types and making up a biologic genealogy. He merely recognized the burial of existing types of life during a previous incursion of the sea. Xanthus, a century later, and Herodotus, still later, recorded other cases of fossil remains and strengthened the theory of former inundations. Empedocles, in the fifth century, studied Etna and noted other signs of internal heat and became the father of all such as believe in a molten interior.

The doctrine of a round earth grew into the creed of a school when the Pythagoreans adopting it gave it a congenial metaphysical basis and made it popular with the Greeks The sphere is the most perfect of forms; it is therefore the fittest form for the home of man; hence it is the form of the home of man. The Sophists and the Platonists as they came into influence still further pushed into ascendency the dialectic and imaginative tendencies in earth study, and the scientific mode of proceeding by successive tests, never as yet more than feeble, was overwhelmed. There was some little recovery under the leadership of Aristotle, who combined in a singular way the speculative and the empirical methods. He recognized stages of earth development and some other vital features, but there was little of the spirit or method of modern geology in his treatment of the earth. Theophrastus wrote on minerals, stones, and fossils, and something approaching a text in geological lines began to become available.

A contribution of the genuine scientific type came out of Egypt when, near the middle of the third century B.C., Eratosthenes measured a degree and thus laid the basis for a real estimate of the size of the earth. To this solid contribution he added various hypotheses of the more sober order relative to mountain chains, to the former presence of the ocean above the continents as implied by fossils, to the work of water, and to the phenomena of volcanoes and earthquakes.

The Roman period naturally brought a more realistic spirit and in the course of the wide expansion of the Empire, a larger need for geographic and geologic information. Strabo, Seneca, Pliny the Elder, and Pliny the Younger added largely to the stock of earth knowledge, as well as suggestive interpretations of the more striking of the earth processes. In their treatment of volcanoes, earthquakes, subsidences, and elevations, as well as the work of water, they often touched interpretational grounds occupied later by the older school of geologists.

Marinus of Tyre and Ptolemy of Egypt added much oriental knowledge to the accretions of the Greeks and Romans, and all this material coming later into the hands of the Arabs was partially saved from destruction during the brecciating stages that followed the downfall of Rome, and thus became the possible seeds of a revival of earth study in Europe when it emerged several centuries later from the shadows of the dark ages. In actual fact the revival was probably more largely spontaneous than inherited.

The Transition to a Truer Basis — The brecciation of the Roman Empire not only involved the destruction of a large part of the material for education in earth science that had been gathered by the Egyptians, Phœnicians, Greeks, and Romans, but the catastrophe was followed by the rise of a form of scholasticism that came to be a grave obstacle to the resuscitation of earth study on a true basis. The obstacle was not so much a barrier to the regathering of statistical data as a restraint put upon the free interpretation of the processes by which the earth had come to be what it is. To fully appreciate the educational contribution which geology made in rectifying ethical attitudes and intellectual methods, the sterile obstructive nature of the retrocession of the Middle Ages must be duly weighed.

The issue of these ages at first centered on the nature and meaning of fossils, not altogether a new issue, but one revived with new intensity. On the one hand, it was held that the lifelike shapes in the rocks were the products of a *vis plastica*, or of some form of molding force in the earth, or else were a Mephistophelian device for the deception of man; on the other hand, it was urged that they were true relics of former life entrapped in the growing sediments in the natural course of events. It was at bottom an ethical issue, a question as to the integrity and fidelity of the record of creation, if not of the honesty of the creation itself.

Although Xenophanes had recognized the genuineness of fossils in the sixth century B.C. and had been followed by many others in the classical ages, so great was the retrocession attending the breakup of the Roman Empire and so deep was the neglect into which determinate data had fallen through the establishment of medieval scholasticism, that Leonardo da Vinci in reaffirming the genuineness of fossils was perhaps as much a pioneer in the fifteenth century A.D. as Xenophanes had beer in the sixth century B.C. and no doubt had greater need of courage. The views of Da Vinci were probably original, at least they were concrete and based on the close and accurate observations of an engineer and an artist. While Da Vinci clearly recognized that fossils implied changes of land and sea and were marks of former crustal events, it is not cleat that he saw in them the record of a succession of different faunas and floras. Besides others, he was followed by Alexander, who had observed fossils in the Calabrian mountains, and notably by Francastorio, who built a strong argument on the fossils of the rocks of Verona.

As soon as the genuineness of fossils had made appreciable headway against the imitationists or simulationists, the issue took on a new phase, in which the two parties were those who assigned the fossils to the Noachian deluge and those who held that they recorded a much more ancient history, the diluvialists and the nascent paleontologists. In the belief in a Noachian flood then prevalent there was at once an element of aid and a deterrent. With such a belief, it was not unnatural that fossils should at first be thought to be relics of that flood, and proof of it. Not unnaturally this belief prompted the collection and description of these *diluvii universalis testes* and so added data and broadened interest. At the same time, the belief developed and deeply implanted an erroneous element of interpretation that soon grew to be a formidable barrier to the true view. But with the best minds the very attempt to make the fossils serve as witnesses to the deluge led to observations inconsistent with so recent and so brief an event and turned them toward the true view. Nicolas Steno, in the middle of the seventeenth century, followed a little later by Vallisneri, Moro, and Generelli, gave start to an Italian school working somewhat on modern lines. They are perhaps entitled to be regarded as the pioneers of modern historical geology. In the later part of that century, Robert Hooke of England became the pioneer of an English school of a similar type, and here and there in other parts of Europe there arose centers of like order which spread the leaven of the nascent modern movement, so that by the middle of the eighteenth century the pioneers of the modern school had gained a firm footing. Meanwhile the advocates of mystic simulation or of Mephistophelian purpose had fallen into discredit, but the diluvialists still retained a large and influential following. This school can scarcely be said to have lost a place among contributors to geologic data until the stratigraphic series had been worked out so fully as to leave no question that there had been a long series of successive depositions in which there was imbedded a like succession of faunas, a work which, though much advanced by many workers in the latter part of the eighteenth century, did not become a declared achievement until William Smith of England, Cuvier of France, and others of the early nineteenth century had brought paleontological science into clear definition based on irrefragible evidence. Meanwhile, however, the diluvialists were being gradually replaced by a catastrophic school who assigned the successions of ancient life to a series of creations following previous general or partial destructions.

While these crucial issues relative to life held the front of the stage, notable advances had been made on the inorganic side resulting in a broader and more specific knowledge of the composition and structure of the rocks. This was in part incidental to the study of the strata and the fossils and in part stimulated by economic considerations, but it arose also in part from a growing desire to know for its own sake. Leonardo da Vinci, Nicolas Steno, and others who had taken leading parts in the organic problem, were large contributors here also. Lehmann, Fuchsel, Arduino, and others assembled and systematized the existing knowledge of minerals, rocks, ores, and structural phenomena, and began tabulations of stratigraphical sequence.

Just at the turn of the century a notable issue arose between those who held that the basal rocks were formed by crystallization from solution in water, the Neptunists, led by Werner, and those who held that they were formed by solidification from the molten state, the Plutonists, led by Hutton. The issue went over into the nineteenth century, opinion drifting toward the Huttonian side.

Concurrent with these special movements on the biological and physical sides, there was also a revival of theoretical effort on somewhat firmer grounds than those that stimulated the Greek speculations. Descartes, Leibnitz, and Buffon gave forth views of the formative stages of the earth, which, though inadequate or erroneous, served to gather the scattered thought of the time into unity, to enlarge the field of view, and to stimulate thought in quarters where the unorganized details failed to awaken interest. These were followed near the close of the century by the speculations of Thomas Wright and Kant and by the definite hypothesis of the Marquis de Laplace that later came to monopolize the term Nebular Hypothesis. Thus the latter half of the eighteenth century greatly enriched and gave truer trend to the rather crude rejuvenations of the three previous centuries, and in so doing prepared the way for the more rapid and sounder development of the geologic sciences in the next century.

The nineteenth century was in fact the first round period of really well-organized, wisely directed geologic effort. During the early and middle portions of the century there was a pronounced effort to harmonize the geologic record with the interpretation of the biblical account and with views of creation then widely prevalent. Modified forms of the Laplacian and Kantian hypotheses of genesis came into general acceptance and were woven into these efforts at harmony. The leading dynamical interpretations of the earth were made to conform to the contractional postulates of these hypotheses. The molten earth of Empedocles was a scarcely questioned tenet and was thought to have a firm basis in the rise of internal temperature, in volcanic phenomean and in the cosmologic hypotheses. The early earth was conceived to have been enshrouded in hot gases of immense volume and density which suffered progressive depletion as time went on. Widespread uniform tropical climates were held to have prevailed in the early ages and to have been followed by more diverse and cooler ones in the later ages. Seasons, aridities, and refrigerations were features of the later periods alone and by forecast were made the forerunners of still more complete atmospheric consumption in the future leading on to a final refrigeration. Geological progress was held to be marked by cataclysms destroying all life, and these to be followed by new creations. It is within the memory of the writer that complete destruction of life at the close of the Paleozoic and of the Mesozoic eras respectively was taught in standard American colleges and by the most authoritative American textbooks. At less important stages partial destructions and corresponding creations were thought to have intervened between these greater catastrophies. All distinct species were then held to be new creations. The whole geological conception was thus made to consist of a series of catastrophies and creations in which the destructional and creative factors played alternate parts. Every tenure of existence was thought to be uncertain and the termination of the whole distinctly foreshadowed.

There was, indeed, some dissent from the catastrophic features of these views appearing now and then far back and growing as time went on. Hutton had urged the profound changes that could be wrought in time by the ceaseless action of the quiet agencies, and Lamarck had urged the divergencies of living forms that might be developed by use. Playfair had helped on the Huttonian views. Lyell near the end of the first quarter of the nineteenth century added further to these views and rounded out the whole into the doctrine of uniformitarianism which successfully contested the field with catastrophism during the second quarter of· the nineteenth century and came to be the creed of the dominant school in the latter half of the century.

With the verity of the geological record firmly established, though incomplete, and with the competency of gentle agencies ceaselessly acting sustained by a strong advocacy, the way was prepared for a favorable reception of the doctrine of derivation of plant and animal species through selection when advanced by Darwin and Wallace near the middle of the century. Though this was essentially biological, the establishment of the geologic record was scarcely less than an indispensable prerequisite to any wide acceptance at that time. The profound educational effect of the doctrine of evolution into which this has grown is perhaps quite as much due to geology as to biology so far as current times are concerned. The revolutionary effects of this doctrine of continuity and derivation in the intellectual world are familiar themes and need not be dwelt on here further than to urge their dependence on the verity of the larger history of which life evolution is a part. The full depth and reach of this revolution as an educational agency has not yet been realized and cannot be fully realized until the further evolutions to which it leads have had time to take tangible form and pass their trial periods.

The opening of the twentieth century has brought some of these further evolutions into tangible stages. These seem to foreshadow the issues of the present century. From the mystical ages down to the close of the eighteenth century, the earth and related bodies were commonly assigned a birth from chaos. During the nineteenth century, belief in a more orderly birth from gaseous or quasi-gaseous semichaotic states replaced these. In the closing stages of the nineteenth century the dynamics underlying all these cosmogonies was challenged and a system of dynamics of the same order as that which is now in control, entitled planetesimal because embodied in minute masses, offered in its stead. So also, instead of the previous assumption that the present solar system is the first and only system of its series, the firstborn of chaos, there was offered the hypothesis that the current solar system is but a rejuvenation of an earlier system back of which may lie a genealogy of systems to which no specific limit was assigned. It carries the conception of a slow-grown solid earth in which a molten earth or a general molten interior may probably never have been a feature. The preferential view is that internal stresses have constantly forced to the surface molten rock with its included gases as fast as formed in working volumes, thus building up the crust and feeding the atmosphere and hydrosphere, while the solidity of the interior is preserved. The atmosphere is made the product of coöperative agencies of supply and consumption whose mutual action maintains an oscillating equilibrium within limits congenial to terrestrial life, a system that presumably may continue to maintain the conditions of life for eons yet to come. This new phase of uniformitarianism opens a forecast of indeterminate duration corresponding to the enlarged retrospect it opens in the rejuvenations of past solar systems. The whole constitutes a further step in the reduction of the catastrophic factors and the extension of quiet persistent procedure. Even the rejuvenation of a solar system is made no more catastrophic than the mutually excitive effects of passing stars.

A second feature, a contribution of physics to geology, is the discovery that some of the atoms of the earth are undergoing spontaneous disintegration and in doing so are shooting forth particles at prodigious velocities, implying energies of like prodigious order. This has raised the question, as yet unanswered, whether spontaneous change, and perhaps spontaneous organization, are not universal functions of earth matter and of the cosmic matter to which it is related. However this may be, the new phenomena exalt to the limit of man's imagination the activities and energies of common matter. In the light of this, the earth appears to have little need of an inheritance of internal heat; its volcanic displays may be little more than the product of spontaneous disintegration within. The energies of the solar system seem adequate for the greater projections backward and forward which the later cosmology had already assumed on other grounds.

This sketch of the growth of earth science implies the course of education through which the leaders of thought and the world at large have passed in reaching the present stage of world science. It is a concrete mode of indicating the place which this science has occupied in human progress. The phrase "world science" is here used permissively, for it is that rounded conception which embraces the totality of the earth and its inhabitants from the beginning till now, that has taken deep hold on the thought of the world and has influenced its intellectual development. The branches of earth study take their individual places as special sciences under the more comprehensive world study. These special geologic sciences embrace the subject-matter of most of the courses that form the curricula of the schools and require technical pedagogical treatment.

Deployment of the Geologic Sciences. — While the very essence of ideal geology is the unitary treatment of the organized totality of earth knowledge, its actual growth as a science and as a school study has diverged widely from this ideal. Particular phases of the subject have been taken up more or less sporadically as conditions invited, and this has given a lack of symmetry to its several stages. The geographic phase was the earliest, and geography might ideally have been extended to embrace the earth's composition, structure, processes, and life history, and so have embodied the whole group of earth sciences and the whole history of the earth, but in fact geographic studies were for ages so largely limited to the surface as it is, and to the present relations of the creatures that dwell on it, that the name came to denote this specifically and the term "geology" was coined to embrace the broader study that arose later.

The geographic mode of treatment is now being extended backward into the "geologic" ages and the old surfaces of the earth are being worked out, and so there is in process of development the new science of paleogeography. This is worked out almost wholly by methods known as *geologic* and still the results are assembled and interpreted in a *geographic* sense and take that name.

So, too, while the earlier geography was mainly descriptive of the earth surface as it is, with the growth of the spirit of inquiry into processes and antecedents, there has come into the later study a search for the origin and meaning of the surface features and so the old form of "geographic" treatment has grown more and more toward the "geologic" treatment, that is, toward the study of processes, former states, underlying material, structure, and historical meaning. And so the two sciences run together and overlap, as they should under the newer view of the true relations of the sciences and of their educational functions. The real fields of science overlap, interdigitate and interfuse; geography envelops the earth *in its way* and geology equally compasses the whole *in its way;* not a little of their common ground is identical, belonging equally to both and belonging exclusively to neither.

The ground where geography and geology most intimately meet is embraced under the terms physical geography and physiography. These terms are in part used synonymously and in part distinctively. When the emphasis is laid on the physical features of the surface as *features*, the better usage places the study under physical geography; when the emphasis is laid mainly on the mode of origin and the processes involved, the study takes on a geological aspect and is best placed under physiography as that term is used in America. With such a distinction in mind, physiography was placed in the geological group by those who were pioneers in the educational use of the term in America, while physical geography naturally retains its place in the geographic group.

.Physiography is at once a recent school study and a recent development of geologic science. Powell and Gilbert, pioneers in enunciating the doctrine of the base level and of cycles of erosion, are worthy of being regarded as the fathers of the science, while Davis, Penck, Salisbury, and others have been efficient in developing it. As a means of training, it has the advantage of presenting an available field at the site of every institution, if urban modifications have not destroyed it. The processes that may be studied in action or through their recent results include a large portion of those that enter into stratigraphic and dynamic geology. As respects mental discipline, physiography is a rather rigorous naturalistic study of processes leading on to definite results and forcing rather close interpretations of results in terms of their causes. The actions are measurably complex but not usually so intricate as to confuso careful students. Physiographic study centers on physical processes and touches the biological and the human elements incidentally rather than primarily. In this limitation it keeps on fairly solid grounds and trains students to firmness of mental action and trustworthiness in interpretation. These are its virtues. Its self-imposed limitation lies in leaving the biological and the human elements to be developed in similar ways on their own grounds. These cannot just yet be treated with the firmness and trustworthiness already attained on the physical side and, if they could, their fusion in a single work under a single title at this stage of educational development would be one of doubtful wisdom. It is therefore a mooted question how far the stronger treatment with its limitations should displace the looser treatment of the broader field pending the development of the biologic and anthropic elements on firmer grounds. The argument from supposed superior interest is scarcely pertinent, for superior interest usually lies where intellectual success finds its most tangible victories. The subject is touched again below.

When inquiry first seriously began to penetrate the earth, it took note of the composition and structure of the crust. This led to some knowledge of sedimentary rocks and to the beginning of stratigraphy and historical geology. It led also to a knowledge of volcanic, plutonic, and other crystalline rocks and thus to the geology of the massive terranes, the chief field of petrologic geology, the complement of stratigraphic geology. It led also to the recognition of bowed, warped, crumpled,broken, and shifted rocks and thus to deformative geology (diastrophism). This embraces the study of mountains (orogeny) and of the more general elevations and depressions (epeirogeny). Inquiry led also to the observation that distorted rocks have usually undergone crystallization and chemical modification and hence to metamorphic geology. The whole subject of geologic structure may be embraced under the sub-science geotectonics, and the whole of formational geology under that of geognosy. Vulcanology grew up naturally as a special phase of igneous geology, and seismology grew as naturally out of the study of rapid earth movements of which earthquakes are the most declared form. All these phenomena involve great energies and thus they tie geology to physics, the common borderland of which is treated under geophysics.

As the studies of the general aspects of rocks were carried down to detail it was discovered that the crust is composed of rock elements, conveniently known as rock species, and that these could be further analyzed into definite minerals; hence arose the science of rocks, lithology or petrology, or, when mainly descriptive, petrography; hence also arose the science of mineralogy, back of which lie closely chemistry and crystallography. Down to the latter half of the nineteenth century the study of rocks and minerals went but little beyond naked eye examinations, mechanical tests for hardness, cleavage, and other qualities, and simple chemical tests supported in some degree by full chemical analyses; but optical methods were later introduced, particularly the examination of thin slices of rocks under a polarizing microscope, and this led to a much closer study of rocks and minerals and wrought a revolution in the sciences of mineralogy and petrology from which arose the sub-sciences optical mineralogy and optical petrography.

Petrology is almost inseparably connected with other branches of geology and is generally grouped with geology in university curricula. The relations of mineralogy are less declared. It is oftener grouped with geology than any other science, but it is sometimes associated with chemistry, sometimes made a distinct department, and sometimes, though rarely, coupled with physics on account of the optical factors. The best criterion in such cases of composite relationships is the very practical one of letting the source from which springs the largest student interest be the guide. In this respect the advantage lies largely with geology, for it is from geological phenomena that interest in minerals most largely springs, and it is in geology or in mining that mineralogy finds its largest applications.

The industrial and ornamental uses of rocks and minerals early gave rise to rude forms of economic geology and these utilities have steadily multiplied until this phase of geology has come to be one of wide application. It is the basis of governmental geological surveys and these have contributed greatly to the development of the science, not even excepting those of its phases that do not for the time being seem to have direct industrial importance. Through its economic phases, geology becomes related to several of the technological branches, as mining engineering, metallurgy, ceramics, architecture, etc.

The fundamental part that life relics played in the growth of the sciences implies, as suggested in the historical sketch, the educational relations of general geology to paleontology. When well deployed in an institution, paleontology usually falls into invertebrate paleontology, vertebrate paleontology, and paleobotany. The most recent science on the border line of biology and geology is ecology, a composite study of life in relation to its environment. As a study it is close akin to physiography, and the field work of the two is conveniently conjoined where both are well developed in the same institution. Physiography and plant ecology are natural running mates, and when ecology shall be extended to animals and man and treated on a firm basis, physiography, biologic ecology, and anthropic ecology will form a triumvirate of peculiar educational power and will doubtless set at rest the mooted question mentioned above by taking an indispensable position in standard curricula as effective disciplinary, as well as intellectually nourishing, studies.

When paleontology shall have gathered and elaborated adequate data relative to the psychical phenomena of past life, this will quite surely form the basis of paleopsychology, which will bind paleontologic geology to the modern mental sciences and coöperate with them in dealing with the earlier stages of mental, moral, and social development.

The study of the hydrosphere is a vital part of geology, for the activities of water in its various forms are the special characteristic of the present geologic eon. The geology of the hydrosphere grades into the special sciences of hydrology and oceanology, as also into glaciology and into physiography.

The atmosphere has long escaped an adequate treatment as a geological agent, but it is rapidly coming into its place and paleoclimatology and paleometeorology are foreshadowed sciences. Geological evidence of a cogent order is forcing an abandonment of inherited views on atmospheric phenomena and opening a place for these new sciences. It was thought until recently that the earth was enveloped by a thin atmosphere only, beyond which extremely cold and nearly empty space isolated it from its kin of the solar family. Closer inquiry makes it clear that the atmosphere is not so narrowly limited and that there is some exchange of matter between the members of the solar family. While it is not yet clear what quantitative value this exchange may have, it serves to bring the study of cosmologic relations into the present problems of geology, and to suggest that cosmology may come to play, in current issues, a part kindred to the more spectacular function played at the birth of the earth.

Geology in the Schools. — While the general geologic knowledge of the earlier ages grew up from the incidental observations of the multitude as they came into contact with the earth, geology as a formal study came into the higher horizons of the schools from the few who patiently worked it out into science, and it has gradually been working downward from higher to the lower horizons. A century ago geology scarcely had a recognized place in even the foremost institutions, save in certain economic aspects in certain schools of mines. Its growth as a distinct school study is almost compassed within the last hundred years, and much the most of the growth falls within the last half century. At first geology found a place only in the last years of study, and it has crept forward in the curriculum only slowly. The chief reason assigned for this retention of a late place is the need of studying so many other sciences before geology is taken up. While there is reason in this, the logic rests upon the doubtful assumption that it is best to proceed from science to phenomena rather than from phenomena to science. It remains to be seen whether the advantages of rotation and reciprocity in cultivating science may not be as conducive to productiveness as they are in the cultivation of soils. The spread of geologic studies seems to have been more rapid down the upper horizons of different grades of institutions than down the courses of the same institution; and so at present, geology finds a place in the upper grades of secondary schools, while it rarely appears in the first years of the higher institutions. But in some form it now has a place in the best schools from the high school to the university.

Geology and Physiography in the High Schools.— A notable percentage of high schools in America are coming to offer courses in which the agents, processes, and stages of fashioning the earth's surface are factors. Whether this is done under the name physical geography, physiography, or geology is of minor importance. The order named seems to be that of predominance so far as the name is concerned. It is impracticable to ascertain precisely how the earth studies are handled on the average. It is safe to say, however, that the genetic phases of surface configuration, the vitalizing element, have rapidly gained in emphasis in recent years. The number of high schools that teach geological history is quite a minor fraction. With the growth of the study of surface fashioning processes, in essence dynamic geology, there has been a tendency to replace other forms of geology with this more special phase, a gain in intensity with a loss in breadth and in the biologic and human elements. This is a step in intensification whose value can only be fully seen when the complementary intensification in the biologic and anthropic factors, the plant, animal, and human ecologies, are brought into working order coördinately with physiography. Plant ecology is already coming into function as a companion study to physiography, and both are well adapted to the earlier years and form an excellent basis for the higher ecologies. These latter are in process of scientific development and will no doubt soon enter upon their early trial periods in the schools. These require greater breadth, equipoise, and maturity of judgment and are better adapted to the later years. They may well follow or go with historical geology, for historical geology brings into view the great facts of past ecological experience. The double couplet, physiography and insentiate ecology, earth history and sentiate ecology, together cover in a strong way the ground covered in a more general fashion by physical geography, and constitute its appropriate successors in an effective curriculum.

Physiography and plant ecology converge in the phenomena of the soil, which is a special zone of contact. They come to be particularly intimate in the ecology of soil life, the critical point of advance in agriculture at present. They are the fundamental sciences on which soil science should rest and are therefore the sciences that may well be given in the high schools as a preparation for agricultural science now pressing for a place in these schools. Animal ecology has a similar relation to the animal industries.

The present status of earth science in the secondary schools is eminently one of transition which, though marked by elements of confusion and some retrocession, is working rapidly toward a vitalization of geography by the introduction of the geologic element all down through the courses, by the introduction of physiography, and by the organization of the ecologies as more thorough treatments of vital phenomena on the earth's surface.

In Normal Schools. — There is much difference in the work of the normal schools, but the standard state normal schools of America usually give courses in physiography or geology or both, and in some schools other geologic branches of the group are taught. The appointments are generally fair and field and laboratory work are commonly used as vitalizing elements. The introduction of strong courses in physiography and plant ecology in the early years and of historical geology and the higher ecologies in the later years will greatly aid in vitalizing geography and in leading on to the successful treatment of these subjects themselves in the high schools.

In Colleges and Technical Schools. — Geology has a recognized place in the best colleges of America and in equivalent institutions elsewhere, though there are many weak colleges in which it has little or no place. In the stronger colleges it is deployed into mineralogy, physiography, petrology, general geology, and paleontology. Economic geology is not uncommonly given a place. Laboratory and field work are usual accompaniments. Geology is even accredited as an entrance study to some colleges. All colleges of standing are provided with mineralogical and geological collections. In the best colleges the full services of a professor, sometimes, though but rarely, with an assistant, are given to the geologic group; in many colleges, however, some other work is still associated with the geological.

In the technological schools not associated with universities, the place of the geological sciences varies from an amount comparable to that of the colleges to an amount comparable with the provisions of the better universities. Usually the emphasis is laid chiefly on mineralogy, petrography, and the structural, dynamical, and economic elements of geology. For these branches the appointments are usually good and the work in graphic, dynamic, and geometric lines is usually superior to that of most other institutions.

In Universities. — The geologic sciences naturally find their largest place and their best deployment in the universities and in the technological institutes of comparable grade.

To form some idea of the relative place which the geologic sciences have attained in the standard universities, a series of comparisons has been made between the sizes of the staffs of the several universities of the largest and of the medium types, and the total number of students in these institutions. It would be more satisfactory to compare the courses and the number of students in geology with the courses and students in other subjects, but the data are not available. In comparing the statistics relative to the staffs, teachers of mineralogy, petrology, paleontology, and geophysics are included with those of geology proper, except where these subjects are taught in other than the geologic senses, but teachers of geography are not included. The number of students used is, in all cases, the total attending the university. The data used were compiled chiefly from Trübner's *Minerva, Jahrbuch der gelehrten Welt,* for the year 1910–1911, with such revisions and additions as could be made from the official publications of the universities and from personal information. The results are to be regarded as a representative rather than as an exact exhibit.

In the comparison of the largest universities, an attendance of 3000 students was taken as the lower limit. Of this class there are 43 universities, distributed as follows: United States 16, Russia 6, Austro-Hungary 4, Germany 4, Great Britain 4, Italy 2, Spain 2, Argentina 1, Canada 1, France 1, Japan 1, and Roumania 1. In respect to total number of geologic teachers (those of professorial rank in parenthesis), the order is: United States (57) 96, Austro-Hungary (20) 26, Germany (17) 28, Russia (12) 21, Great Britain (9), Roumania (5), France (4) 5, Argentina (3), Canada (3), Italy (2) 7, Japan 5, Spain (1) 2. The average number of geologic teachers per university is: Germany 7, Austro-Hungary 6.5, United States 6, France 5, Japan 5, Roumania 5, Italy 3.5, Russia 3.5, Argentina 3, Canada 3, Great Britain 2.25, Spain 1.

For the medium class, universities whose students range between 2000 and 3000 were selected. These serve better than the previous class to illustrate the development of geological instruction in the smaller countries and in universities located in the smaller cities where urban influences are less pronounced. There are 30 universities of this class distributed as follows: Germany 7, United States 6, France 4, Austro-Hungary 3, Belgium 2, Italy 2, Russia 2, Canada 1, Great Britain 1, Greece 1, Sweden 1.

In the aggregate number of geologic teachers (those of professorial rank in parenthesis), the order is as follows: Germany (19) 28, Italy (5) 15, France (10) 11, United States (9) 10, Austro-Hungary (7) 9, Russia (3) 6, Belgium (5), Canada (2), Great Britain (1), Greece (1), Sweden 1.

The average number of geologic teachers per university in this class is as follows: Italy 7.5, Germany 4, Austro-Hungary 3, Russia 3, Belgium 2.5, France 2.5, Canada 2, United States 1.7, Great Britain 1, Greece 1, Sweden 1.

The combined data for the two classes of universities, which embrace all that are attended by 2000 or more, are shown in the following table: —

COMPARATIVE TABLE OF GEOLOGIC STAFFS OF UNIVERSITIES HAVING 2000 STUDENTS OR MORE

I	II	III	IV	V	VI	VII	VIII	IX
COUNTRY	POPULATION	NO. OF UNIVERSITIES	TOTAL NO. UNIVERSITY STUDENTS	NO. OF GEOLOGIC PROFESSORS	TOTAL GEOLOGIC TEACHERS	AV. NO. PER UNIVERSITY	RATIO OF TEACHERS TO TOTAL STUDENTS	RATIO OF GEOLOGIC TEACHERS TO POPULATION
Austro-Hungary . .	27,995,000 (1907)	7	31,147	27	35	5	1 : 890	1 : 799,857
Belgium	7,386,000 (1908)	2	5272	5	5	2.5	1 : 1054	1 : 1,477,200
Canada	7,185,000 (1909)	2	5289	5	5	2.5	1 : 1058	1 : 1,437,000
France	39,252,000 (1906)	5	27,882	14	16	3.2	1 : 1743	1 : 2,453,250
Germany	63,800,000 (1909)	11	46,379	36	56	5.1	1 : 828	1 :1,139,286
Great Britain . . .	45,208,000 (1909)	5	13,752	10	10	2	1 : 1375	1 : 4,520,800
Italy	34,269,000 (1909)	4	14,588	7	22	5.5	1 : 663	1 : 1,557,682
Japan	49,769,000 (1909)	1	5649		5	5	1 : 1130	1 : 9,953,800
Roumania	6,700,000 (1908)	1	3878	5	5	5	1 : 776	1 : 1,340,000
Russia	126,169,000 (1908)	8	37,564	15	27	3.4	1 : 1391	1 : 4,672,926
Spain	19,712,000 (1908)	2	9845	1	2	1	1 : 4923	1 : 9,856,000
Sweden	5,377,000 (1907)	1	2056	1	3	3	1 : 685	1 : 1,792,333
United States . . .	90,000,000 (1910)	22	87,433	66	106	4.8	1 : 825	1 : 849,056
Totals . . .	516,543,000	73	278,164	206	301	4.1	1 : 897	1 : 1,666,268

The average geologic staff for the 73 universities is 4.1. The largest staff numbers 17. The average ratio of geologic teachers to students in the whole 73 universities is 1:897. The best ratio in a single university is 1:250. The ratio in the university that has the largest staff is 1:412.

An inspection of similar data for previous years shows that there has been a very rapid increase in the provisions for geological instruction, particularly in the United States.

Educational Methods. — Geological education takes on two distinct phases, (1) instruction at the institution and (2) training in the field. The intramural work takes the form of lectures, class discussions, quizzes, conferences, personal work, seminars, and clubs. Lectures hold a large place and must apparently continue to do so in those branches where the material of instruction is not yet well organized. Systematic quizzes are used by many teachers as a supplement to lectures. Class discussion and group conferences are felt by many to be the most efficient mode of training when the subject matter is in suitable form. Conferences are particularly applicable to map study where only small groups are permissible. Personal instruction where the work can be made individual, as in laboratory, experimental, and thesis work, is widely employed. Seminars for advanced work and clubs for reports of individual work, critiques, discussions, lectures not in course, especially lectures by visiting geologists, are valuable adjuncts. Courses in drawing and in graphic work are given in some universities. (2) Field work is a distinctive feature of the most effective geologic training. This falls into two classes, the circum-institutional and the remote. The first is often immediately associated with the classroom courses and is then arranged so as to fit in with the program of the latter. It is also arranged independently into systematic courses occupying certain days of the week. Occasional excursions, not exceeding a day's duration, fall into the circum-institutional class. The distant field work is handled in a more varied way. Often it consists only of special excursions of a few days' duration, which are stimulative but not adapted to close training. Of the more systematic work a three-course system is perhaps the best representative in actual use. (1) In this, the first course is shaped to follow the earlier classroom courses. It consists of a systematic study of a selected area in the manner of official geological surveys, and is followed by a report on the work by each student participating. The time ranges from a month upward, and the area is preferably one of the quiet type, not too plainly exposed, nor too intricate, suited to promote careful search for data and yet to yield decisive results to diligent students. (2) The second course consists preferably of work on a larger, more complex, and more impressive area suited to develop larger and more intricate conceptions, and to be the basis of reports of a broader type. Both these courses are under the immediate direction of competent leaders, and the numbers participating are limited to those whose work can be individually supervised. (3) The third course is individual, and is often the basis of the Doctor's thesis. The selection of the area, the plan of work, the choice of problems, and the style of report are chosen by the student under the criticism of the specialist in the line chosen, original independent work being here the chief end sought. The report is expected to be elaborate and presumed to be representative of the student's best capabilities.

Special courses in topographic and geologic mapping are given in the best institutions, sometimes in connection with these field courses, and sometimes independently. Special paleontological or other specific field courses are sometimes given. Incidentally, field work is often done in vacations in connection with official or other geological surveys.

The advanced work in geology is chiefly done in the graduate schools. In the standard institutions it involves at least three years' work in addition to the more general and elementary work of the undergraduate courses. Theses of three kinds are prepared, though rarely all in the same institution, one preliminary to the Bachelor's degree at the close of the undergraduate course, one preliminary to the Master's degree after one or more years of graduate work, and one prerequisite to the Doctor's degree for which three years of graduate work is usually required.

Appliances. — Equipment for geological work centers upon an effort to bring nature as close to the student as possible, and, next after field work, three classes of appliances are resorted to: (1) actual samples, (2) models, and (3) photographs. Collections more or less varied and extensive are common possessions. Practice varies in the emphasis laid on museum exhibits and on classroom and laboratory collections respectively; a merely synoptic exhibit in the museum, to give distinct impressions of the types, and large working collections and illustrative collections in drawers and in the classrooms and laboratories are urged by some experienced teachers. A museum so located that the students are naturally brought into constant contact with it is also urged. Models play a large part in a satisfactory equipment, especially relief models and raised maps. Photographic art has made valuable contributions here as in other sciences, ample collections of photographs systematically arranged for study, photographic wall exhibits and transparencies, and especially lantern slides with lantern fixtures ready for prompt use as required are indispensable adjuncts.

For special classes of work the requisites for efficiency generally possessed by the standard universities include: For mineralogical, petrologic, structural, and paleontological work, laboratories and laboratory appliances, embracing working collections, models, testing tools, blowpipe outfits, chemicals, rock-slicing machines, microscopes, goniometers, photographic and other appliances; for map study, conference tables and map stacks in cases that facilitate access; for classroom work, wall exhibits of maps, sections, photographs, transparencies, globes, plain and in relief, with ample lantern outfit; for museum study, exhibit collections and drawer collections in various lines; for all classes of study an ample library well supplied with maps and preferably organized as a departmental library, well situated in the midst of the geologic rooms and used as the students' working home.

Educational Literature. — The available literary material in the geological sciences has been greatly enriched in recent years. Revisions of standard works have been frequent and new treatises have been added at short intervals. The formulated literature of the science in its more general aspects does not lag far behind the science itself. These formal educational works are supplemented by geological journals, some of which are published under the auspices of educational institutions and are edited with a special view to educational service. Bulletins giving the results of researches are published by some universities. In the broader educational sense, the numerous official surveys are effective agencies and their reports are a leading source of working material. Some of these reports are especially shaped for educational purposes. So, too, the geological societies, both in themselves and in their publications, are great educational aids, especially in that they are a means of education of the educators, a function of the most radical value. T. C. C.

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GEOMETRY. — Etymologically the word means earth measure, from the Greek *γῆ*, *gē*, earth + *μέτρον*, *metron*, measure. It has come, however, to mean the general science of form, the words "surveying" and "geodesy" being applied to the measuring of the earth.

History of Geometry. — The earliest documents relating to geometry come to us from Babylon and Egypt. Those from Babylon are written on small clay tablets, some of them about the size of the hand, these tablets afterwards having been baked in the sun. They show that the Babylonians of that period knew something of land measures, and perhaps had advanced far enough to compute the area of a trapezoid. For the mensuration of the circle they later used, as did the early Hebrews, the value $\pi = 3$. A tablet in the British Museum shows that they also used such geometric forms as triangles and circular segments in astrology or as talismans, and a stone astrolabe in the same collection shows that they knew something of angle measure.

The Egyptians must have had a fair knowledge of practical geometry long before the date of any mathematical treatise that has come down to us, for the building of the pyramids, between 3000 and 2400 B.C., required the application of several geometric principles. Some knowledge of surveying must also have been necessary to carry out the extensive plans for irrigation that were executed under Amenemhat III, about 2200 B.C.

The first definite knowledge of Egyptian mathematics is based on a manuscript copied on papyrus, a kind of paper used about the Mediterranean in early times. This copy was made by one Aah-mesu (The Moon-born), commonly called Ahmes (*q.v.*), who probably flourished about 1700 B.C. The original from which he copied, written about 2300 B.C., has been lost, but the papyrus of Ahmes, written nearly four thousand years ago, is still preserved, and is now in the British Museum. In this manuscript, which is devoted chiefly to fractions and to a crude algebra, is found some work on mensuration. Among the curious rules are the incorrect ones that the area of an isosceles triangle equals half the product of the base and one of the equal sides; and that the area of a trapezoid having bases b, b', and the nonparallel sides each equal to a, is $\frac{1}{2} a (b + b')$. One noteworthy advance appears, however. Ahmes gives a rule for finding the area of a circle, substantially as follows: Multiply the square on the radius by $(\frac{16}{9})^2$, which is equivalent to taking for π the value $3.1605\cdots$. This papyrus also contains some treatment of the mensuration of solids, particularly with reference to the capacity of granaries. There is also some slight mention of similar figures, and an extensive treatment of unit fractions, — fractions that were quite universal among the ancients. (See FRACTIONS.) Herodotus tells us that Sesostris, king of Egypt, divided the land among his people and marked out the boundaries after the overflow of the Nile, so that surveying must have been well known in his day. Indeed, the *harpedonaptæ*, or rope stretchers, acquired their name because they stretched cords in which were knots, so as to make the right triangle 3, 4, 5, when they wished to erect a perpendicular. This is a plan occasionally used by surveyors to-day, and it shows that the practical application of the Pythagorean theorem was known long before Pythagoras gave what seems to have been the first general proof of the proposition.

From Egypt, and possibly from Babylon, geometry passed to Asia Minor and Greece. The scientific study of the subject begins with Thales (*q.v.*). How elementary the knowledge of geometry then was may be understood from the fact that tradition attributes to him only about four propositions. The greatest pupil of Thales, and one of the most remarkable men of antiquity, was Pythagoras (*q.v.*). In geometry he is said to have been the first to demonstrate the proposition that the square on the hypotenuse is equal to the sum of the squares upon the other two sides of a right triangle. The proposition was known in India and Egypt before his time, at any rate for special cases, but he seems to have been the first to prove it. To him or to his school seems also to have been due the construction of the regular pentagon and of the five regular polyhedrons. Pythagoras is also said to have known that six equilateral triangles, three regular hexagons, or four squares, can be placed about a point so as just to fill the 360°, but that no other regular polygons can be so placed. To his school is also due the proof for the general case that the sum of the angles of a triangle equals two right angles.

For two centuries after Pythagoras geometry passed through a period of discovery of propositions. The state of the science may be seen from the fact that Oenopides of Chios, who flourished about 465 B.C., and who had studied in Egypt, was celebrated because he showed how to let fall a perpendicular to a line, and how to make an angle equal to a given angle. A few years later, about 440 B.C., Hippocrates of Chios wrote the first Greek textbook on mathematics. He knew that the areas of circles were proportional to the squares on their radii, but was ignorant of the fact that equal central angles or equal inscribed angles intercept equal arcs. Antiphon and Bryson, two Greek scholars, flourished about 430 B.C. The former attempted to find the area of a circle by doubling the number of sides of a regular inscribed polygon, and the latter by doing the same for both inscribed and circumscribed polygons. They thus approximately exhausted the area between the polygon and the circle, and hence this method is known as the method of exhaustions. About 420 B.C. Hippias of Elis invented a certain curve called the quadratrix, by means of which he could square the circle and trisect any angle. This curve cannot be constructed by the unmarked straightedge and the compasses, and when we say that it is impossible to square the circle or to trisect any angle, we mean that it is impossible by the help of these two instruments alone.

During this period the great philosophic school of Plato (429–348 B.C.) flourished at Athens, and to this school is due the first systematic attempt to create exact definitions, axioms, and postulates, and to distinguish between elementary and higher geometry. It was at this time that elementary geometry became limited to the use of the compasses and the unmarked straightedge, which took from this domain the possibility of constructing a square equivalent to a given circle (" squaring the circle "), of trisecting any given angle, and of constructing a cube that should have twice the volume of a given cube (" duplicating the cube "), these being the three famous problems of antiquity. One of Plato's pupils was Philippus of Mende, in Egypt, who flourished about 380 B.C. It is said that he discovered the proposition relating to the exterior angle of a triangle. His interest, however, was chiefly in astronomy. Another of Plato's pupils was Eudoxus of Cnidus (408–355 B.C.). He elaborated the theory of proportion, placing it upon a thoroughly scientific foundation. It is probable that Book V of Euclid, which is devoted to proportion, is essentially the work of Eudoxus.

The first great textbook on geometry, and the greatest one that has ever appeared, was written by Euclid (*q.v.*). In his work Euclid placed all of the leading propositions of plane geometry then known, and arranged them in a logical order. Most geometries of any importance written since his time have been based upon Euclid, improving the sequence, symbols, and wording as occasion demanded.

The Greeks contributed little more to elementary geometry, although Apollonius of Perga (*q.v.*), who taught at Alexandria between 250 and 200 B.C., wrote extensively on conic sections, and Hypsicles of Alexandria, about 190 B.C., wrote on regular polyhedrons. Hypsicles was the first Greek writer who is known to have used sexagesimal fractions, — the degrees, minutes, and seconds of our angle measure. Zenodorus (180 B.C.) wrote on isoperimetric figures, and his contemporary, Nicomedes of Gerasa, invented a curve known as the conchoid, by means of which he could trisect any angle. Another contemporary, Diocles, invented the cissoid, or ivy-shaped curve, by means of which he solved the famous problem of duplicating the cube; that is, of constructing a cube that should have twice the volume of a given cube.

The greatest of the Greek astronomers, Hipparchus (*q.v.*, 180–125 B.C.), lived about this period, and with him begins spherical trigonometry as a definite science. A kind of plane trigonometry had been known to the ancient Egyptians. The Greeks usually employed the chord of an angle instead of the half chord (sine), the latter having been preferred by the later Arab writers. The most celebrated of the later Greek physicists was Heron of Alexandria (*q.v.*), formerly supposed to have lived about 100 B.C., but now assigned to the first century A.D. His contribution to geometry was the formula for the area of a triangle in terms of its sides a, b, and c, with s standing for the semiperimeter $\frac{1}{2}(a+b+c)$. The formula is $\sqrt{s(s-a)\ (s-b)\ \ (s-c)}$. Probably nearly contemporary with Heron was Menelaus of Alexandria, who wrote a spherical trigonometry. He gave an interesting proposition relating to plane and spherical triangles, their sides being cut by a transversal. For the plane triangle ABC, the sides a, b, and c being cut respectively in X, Y, and Z, the theorem asserts substantially that

$$\frac{AZ}{BZ}\cdot\frac{BX}{CX}\cdot\frac{CY}{AY}=1.$$

The most popular writer on astronomy among the Greeks was Ptolemy (Claudius Ptolemæus, *q.v.*, 87–165 A.D.), who lived at Alexandria. He wrote a work entitled *Megale Syntaxis* (*The Great Collection*), which his followers designated as *Megistos* (greatest), on which account the Arab translators gave it the name *Almagest* (*al* meaning "the"). He advanced the science of trigonometry, but did not contribute to geometry. At the close of the third century Pappus of Alexandria (*q.v.*) wrote on geometry. Only two other Greek writers need be mentioned. Theon of Alexandria (370 A.D., *q.v.*), the father of the Hypatia (*q.v.*) who is the heroine of Charles Kingsley's well-known novel, wrote a commentary on Euclid to which we are indebted for some historical information. Proclus (412–485 A.D., *q.v.*) also wrote a commentary on Euclid, and much of our information concerning the first Book of Euclid is due to him.

The East did little for geometry, although contributing considerably to algebra. The first great Hindu writer was Aryabhatta (*q.v.*), who was born in 476 A.D. He, or a later namesake of his, gave the very close approximation for π, expressed in modern notation as 3.1416. He also gave rules for finding the volume of the pyramid and sphere, but they were incorrect, showing that the Greek mathematics had not yet reached the Ganges. Another Hindu writer, Brahmagupta (born in 598 A.D., *q.v.*), wrote an encyclopedia of mathematics. He gave a rule for finding Pythagorean numbers, expressed in modern symbols as follows:—

$$\tfrac{1}{4}\left(\frac{p^2}{q}+q\right)^2=\tfrac{1}{4}\left(\frac{p^2}{q}-q\right)^2+p^2.$$

He also generalized Heron's formula by asserting that the area of an inscribed quadrilateral of sides a, b, c, d, and semiperimeter s, is $\sqrt{(s-a)\ (s-b)\ (s-c)\ (s-d)}$.

The Arabs did much for mathematics, translating the Greek authors into their language and also bringing learning from India. Indeed, it is to them that modern Europe owed its first knowledge of Euclid. They contributed nothing of importance to elementary geometry, however. The greatest of the Arab writers was Mohammed ibn Musa al-Khowarazmi (820 A.D., *q.v.*), who lived at Bagdad and Damascus. Although chiefly interested in astronomy, he wrote the first book bearing the name *algebra* (*Al-gebr w'al-muqabala*, Restoration and Equation), composed an arithmetic using the Hindu numerals, and paid much attention to geometry and trigonometry.

Euclid was translated from the Arabic into Latin in the twelfth century, Greek manuscripts not being then at hand, or being neglected because of ignorance of the language. The leading translators were Adelhard of Bath (1120, *q.v.*), an English monk; Gherardo of Cremona (1160), an Italian monk; and Johannes Campanus (1250), chaplain to Pope Urban IV. The greatest European mathematician of the Middle Ages was Leonardo of Pisa. (See FIBONACCI, LEONARDO.) He was very influential in making the Hindu-Arabic numerals known in Europe. He wrote extensively on algebra, and was the author of one book on geometry, but he contributed nothing to the elementary theory. The first edition of Euclid was printed in Latin in 1482, the first one in English appearing in 1570.

There has of late arisen a modern elementary geometry devoted chiefly to special points and lines relating to the triangle and the circle, and many interesting propositions have been discovered. The subject is so extensive that it cannot find any place in our crowded curriculum, and must necessarily be left to the specialist. Some idea of the nature of the work may be obtained from a mention of a few propositions.

The bisectors of the various interior and exterior angles of a triangle are concurrent by threes in the incenter or in one of the three excenters of the triangle.

The common chord of two intersecting circles is a special case of their radical axis, and tangents to the circles from any point on the radical axis are equal.

If O is the orthocenter of the triangle ABC; and X, Y, Z are the feet of the perpendiculars from A, B, C respectively; and P, Q, R are the mid-points of a, b, c respectively; and L, M, N are the mid-points of OA, OB, OC respectively; then the points $L, M, N - P, Q, R, - X, Y, Z$, all lie on a circle, the "nine points circle."

Reasons for Studying Geometry.—It has always been held that geometry is studied because of a peculiar training and pleasure that this science gives, and that other sciences do not give, at least in the same degree. With the investigations of modern psychologists there has come a doubt as to the value of the training that it gives, and this has led many emotional followers of new doctrines to proclaim that geometry has no such claim upon the pupil's time as the advocates of this value assert. Modern educators do not claim, however, that geometry has no value *per se,* but rather that the methods of presenting the subject that have obtained in the past can be improved, and that certain of the values formally claimed for it do not exist. To this the more thoughtful teachers of the subject have long since assented. For example, it was poor policy to memorize all of geometry, for this plan took away the pleasure of the study, and it did not give the pupil any power that he could carry over into other lines of work, save as he acquired facts which he could have obtained as well without the labor of memorizing the proofs of Euclid.

The advocates of a substantial geometry, as opposed to the mere acquisition of a few rules of mensuration, claim that the study of geometry brings great pleasure and an inspiring mental uplift, when the subject is properly presented. They place it in this respect upon a plane similar to that upon which the study of literature and music rests. They further claim that through geometry a student acquires a knowledge of space relations that he does not acquire from other subjects, which knowledge he carries over into the study of the graphic and plastic arts, of geography and astronomy, and of the science of mechanics. They also assert that geometry is the only subject in the secondary curriculum that gives a specific training in deductive logic, and that this training gives a habit of thought that is carried over into other lines of mental activity. And finally they claim that habits of persistence, of using only the necessary steps in an argument, of holding to that which is true, of seeking for exact truth, and of arranging work in logical order, are instilled by the study of geometry, and that these habits are unconsciously transferred to other fields of work. In other words, they claim that the pleasure and the profit of approach to exact truth give a power that makes the pupil stronger in his other activities. This claim is sanctioned by the opinions of most people who have studied geometry under a worthy teacher, and no investigations thus far made have shaken it. The statement that geometry has no value as a mental discipline is usually found to mean that there is no such thing as mental discipline as defined by the antagonist, to which most people would heartily agree.

Development of the Teaching of Geometry. — Little is known of the teaching of geometry in very ancient times, but its nature can be inferred from the teaching that is still seen in the native schools of the East. Here a man, learned in any science, will have a group of voluntary students sitting about him, and to them he will expound the truth. Such schools may still be seen in India, Persia, and China, the master sitting on a mat placed on the ground or on the floor of a veranda, and the pupils reading aloud or listening to his words of exposition.

In Greece it was taught in the schools of philosophy, often as a general preparation for philosophic study. Thus Thales introduced it into his Ionian school, Pythagoras made it very prominent in his great school at Crotona in southern Italy (Magna Græcia), and Plato placed above the door of his *Academia* the words, " Let no one ignorant of geometry enter here " — a kind of entrance examination for his school of philosophy. In these gatherings of students it is probable that geometry was taught in much the same way as that already mentioned for the schools of the East, a small group of students being instructed by a master. But with these crude materials there went an abundance of time, so that a number of great results were accomplished in spite of the difficulties attending the study of the subject. It is said that Hippocrates of Chios (*c.* 440 B.C.) wrote the first elementary textbook on mathematics and invented the method of geometric reduction, the replacing of a proposition to be proved by another, which, when proved, allows the first one to be demonstrated. A little later Eudoxus of Cnidus (*c.* 375 B.C.), a pupil of Plato's, used the *reductio ad absurdum,* and Plato is said to have invented the method of proof by analysis, an elaboration of the plan used by Hippocrates. Thus these early philosophers taught their pupils, not facts alone, but methods of proof, giving them power as well as knowledge. Furthermore, they taught them how to discuss their problems, investigating the conditions under which they are capable of solution. This feature of the work they called the *diorismus,* and it seems to have started with Leon, a follower of Plato. Between the time of Plato (*c.* 400 B.C.) and Euclid (*c.* 300 B.C.) several attempts were made to arrange the accumulated material of elementary geometry in a textbook. Plato had laid the foundations for the science, in the form of axioms, postulates, and definitions, and he had limited the instruments to the straightedge and the compasses. Aristotle (*c.* 350 B.C.) had paid special attention to the history of the subject, thus finding out what had already been accomplished, and had also made much of the applications of geometry.

Of the other Greek teachers there is but little information as to methods of imparting instruction. It is not until the Middle Ages that much is known in this line. Whatever of geometry was taught seems to have been imparted by word of mouth in the way of expounding Euclid, and this was done in the ancient fashion. The early Church leaders usually paid no attention to geometry, but as time progressed the *quadrivium,* or four sciences of arithmetic, music, geometry, and astronomy, came to rank with the *trivium* (grammar, rhetoric, dialectics), the two making up the seven liberal arts (*q.v.*). All that there was of geometry in the first thousand years of Christianity, however, at least in the great majority of Church schools, was summed up in a few definitions and rules of mensuration. Gerbert (*q.v.*), who became Pope Sylvester II in 999 A.D., gave a new impetus to geometry by discovering a manuscript of the old Roman surveyors and a copy of the geometry of Boethius (*q.v.*) who paraphrased Euclid about 500 A.D. He thereupon wrote a brief geometry, and his elevation to the papal chair tended to bring the study of mathematics again into prominence.

Geometry now began to have some place in the Church schools, naturally the only schools of high rank in the Middle Ages. The study of the subject, however, seems to have been merely a matter of memorizing. Geometry received another impetus in the book written by Leonardo of Pisa (see FIBONACCI, LEONARDO) in 1220, the *Practica Geometriæ*. Euclid was also translated into Latin about this time (strangely enough, as already stated, from the Arabic instead of the Greek), and thus the treasury of elementary geometry was opened to scholars in Europe. From now on, until the invention of printing (*c.* 1450), numerous writers on geometry appear, but so far as is known the method of instruction remained much as it had always been. The universities began to appear about the thirteenth century, and Sacrobosco (*q.v.*), a well-known medieval mathematician, taught mathematics about 1250 in the University of Paris. In 1336 this university decreed that mathematics should be required for a degree. In the thirteenth century Oxford required six books of Euclid for one who was to teach, but this amount of work seems to have been merely nominal, for in 1450 only two books were actually read. The universities of Prague (founded in 1350) and Vienna (*Statutes* of 1389) required most of plane geometry for the teacher's license, although Vienna demanded but one book for the bachelor's degree. So, in general, the universities of the thirteenth, fourteenth, and fifteenth centuries required less for the degree of master of arts than is now required from a pupil in American high schools. On the other hand, the university students were younger than now, and were really doing only high school work.

The invention of printing made possible the study of geometry in a new fashion. It now became possible for any one to study from a book, whereas before this time instruction was chiefly by word of mouth, consisting of an explanation of Euclid. The first Euclid was printed in 1482, at Venice, and new editions and variations of this text came out frequently in the next century. Practical geometries became very popular, and the reaction against the idea of mental discipline threatened to abolish the old style of text. Such writers as Finæus (1556), Bartoli (1589), Belli (1569), and Cataneo (1567), in the sixteenth century, and Capra (1673), Gargiolli (1655), and many others in the seventeenth century, either directly or inferentially took this attitude towards the subject.

The study of geometry in the secondary schools is relatively recent. The Gymnasium at Nuremberg, founded in 1526, and the Cathedral school at Württemberg (as shown by the curriculum of 1556), seem to have had no geometry before 1600, although the Gymnasium at Strassburg included some of this branch of mathematics in 1578, and an elective course in geometry was offered at Zwickau, in Saxony, in 1521. In the seventeenth century geometry is found in a considerable number of secondary schools, as at Coburg (1605), Kurpfalz (1615, elective), Erfurt (1643), Gotha (1605), Giessen (1605), and numerous other places in Germany, although it appeared but rarely in the secondary schools of France before the eighteenth century. In Germany the *Realschulen* came into being in the eighteenth century, and considerable effort was made to construct a course in geometry that should be more practical than that of the modified Euclid. At the opening of the nineteenth century the Prussian schools were reorganized, and from that time on geometry has had a firm position in the secondary schools of all Germany. In the eighteenth century some excellent textbooks on geometry appeared in France, among the best being that of Legendre (1794), which influenced in such a marked degree the geometries of America. Soon after the opening of the nineteenth century the *lycées* of France became strong institutions, and geometry, chiefly based on Legendre, was well taught in the mathematical divisions. A worthy rival of Legendre's geometry was the work of Lacroix, who called attention continually to the analogy between the theorems of plane and solid geometry, and even went so far as to suggest treating the related propositions together in certain cases.

In England the secondary schools, such as Rugby, Harrow, and Eton, did not commonly teach geometry until quite recently, leaving this work for the universities. In Christ's Hospital, London, however, geometry was taught as early as 1681, from a work written by several teachers of prominence. The highest class at Harrow studied "Euclid and vulgar fractions" one period a week in 1829, but geometry was not seriously studied before 1837. In the Edinburgh Academy as early as 1835, and in Rugby by 1839, plane geometry was completed.

Not until 1844 did Harvard require any plane geometry for entrance. In 1855 Yale required only two books of Euclid. It was therefore from 1850 to 1875 that plane geometry took its definite place in the American secondary school.

Present Status of the Teaching of Geometry. — Plane geometry is now commonly taught in the United States in the tenth school year, the second year of a four-year high school. This is usually followed by a half year of solid geometry, frequently elective. It is not the universal custom to finish all of plane geometry in a single year, although this is done in many of the best schools, and it probably represents the future curriculum as to the amount of time to be allowed to the subject. There is at present a tendency to reduce the number of basal propositions and to increase the number of exercises, so as to give a student more opportunity for independent work. The Eastern colleges do not require solid geometry for entrance to the arts course, while the Western ones frequently do require it. This means that more work is covered in plane geometry in the secondary schools of the Eastern states, the amount of time spent on the entire subject of geometry being about the same. From every standpoint it would be better that a pupil should sacrifice some of plane geometry for the purpose of having an introduction to solid geometry, if he could acquire the latter only in this manner.

Certain attempts have been made to teach algebra and geometry simultaneously, or even to fuse them into a single subject. This has usually met with only sporadic success. That the foreign schools have usually run geometry over several years, as opposed to the American plan, is liable to be misunderstood. Where serious demonstrative geometry has been begun early and extended over several years, the results have not been satisfactory. Usually the early geometry has been mere mensuration, a subject that is taught in the American arithmetic, and that is coming to be very satisfactorily taught. It may therefore be said that in America geometry extends over several years, culminating in a year or a year and a half of serious demonstrative work. As to the fusing of the two subjects of algebra and geometry in one, this seems destined to meet with success only in schools in which nothing but a little practical geometry is studied.

The question of the nature of the textbook is one that is periodically agitated. Several types have been suggested: (1) A book with the basal proofs substantially in full, to serve as models, and a large number of well-graded exercises for original work; (2) a syllabus of basal propositions; (3) a book of suggested proofs, heuristic in nature. Of these the first has been the one almost universally used, the objections to it having little force with a good teacher, and the other forms being useless with a poor teacher.

Reforms and Improvements. — Numerous reforms and improvements are being suggested for the treatment of geometry at the present time, and a few of these will be mentioned. (1) That geometry and algebra be fused into a single subject, an effort that takes no account of the fact that the two subjects are distinct in purpose, in results, and in difficulty, and that each has a peculiar interest that is lost when it sacrifices its individuality. (2) That the two subjects be taught simultaneously, two days of one and three of the other during each school week. This has often been tried in the United States, but in the main with unsatisfactory results. Psychologically the argument is that the pupil is not mature enough for this plan, his interest being better maintained by concentrating his energy on either the one or the other. The argument that he would see the relation of one science to the other better by the simultaneous than the tandem arrangement is offset by the custom of the best teachers to bring into algebra as much of the mensuration learned in arithmetic as possible, and to introduce into geometry as many applications of algebra as seem adapted to this purpose. (3) That geometry be converted into an applied science, joining the general industrial movement of the present. This would mean that geometry would cease to exist, since the applications of the subject are merely the rules of mensuration learned in arithmetic, and learned by a natural form of induction. If geometry were abolished it would be possible to introduce other lines of mathematics, such as trigonometry (which requires only very little geometry), calculus (which requires practically no geometry beyond elementary mensuration for a large number of its applications), and some little work in the practical problems of vector analysis. For the great majority of students this seems unwise, since they have little interest in these applications, but in certain forms of technical high schools such an arrangement may prove necessary. (4) That algebra be taught for a half year, followed by geometry for the same length of time, and this by another half year of algebra, followed again by a half year of geometry. This plan has certain advantages over the year arrangement, but as yet it has to justify itself, the general feeling being that the pupil would lose more in immediate interest in a topic than he would gain in sustained interest in mathematics as a whole.

While these suggestions for reform are open to question, other reforms are meeting with general acceptance and are improving the current teaching of geometry. (1) It is universally agreed that Euclid is undesirable as a textbook for beginners, and, even in England where it has so long been the standard, it is now superseded by books more suited to the youthful mind. (2) The propositions of the textbook are coming to be considered more in the light of basal truths, and the proofs as models, and the serious work of the pupils is coming to be more and more in the realm of exercises. (3) The exercises are coming to be more carefully grouped and graded.

(4) Such legitimate applications as can be found, and as give interest to the study of geometry, are being sought for and introduced. (5) More attention is being given to geometric design, so long as this does not detract from the scientific work. (6) In brief, serious effort is being made to make geometry more interesting and useful, and to recognize its game element and its utility, without destroying the values that have long made it a recognized standard subject in the curriculum.

D. E. S.

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GEOMETRY, ANALYTIC. — See Analytic Geometry.

GEORGE III. — See Lancaster, Joseph.

GEORGE JUNIOR REPUBLIC, FREEVILLE, N.Y. — An organization of boys and girls modeled on the government of the United States. It arose out of the summer camps first begun in 1890 by Mr. William R. George, who had for several years studied the "boy problem" among the New York street urchins. One experience after another with the worst type of city boys who regarded charity as their right, who had no moral sense, whose chief aim was to secure something for nothing, led Mr. George from one system of control to another, until he recognized that boys, and girls too, must own something which they valued, that the basis of government is property, that there should be nothing without labor, and that his small community must learn to govern itself. The permanent Republic was launched in the summer of 1895, five boys remaining with Mr. George after summer camp. This number gradually rose until now the village numbers about 150 citizens. In 1896 the George Junior Republic Association was incorporated and a farm was purchased. The government was placed in the hands of the community; a president, vice-president, judge, chief of police, secretary of state, and secretary of the treasury, and a legislature were elected; important practical questions arose and were settled, such as the question of currency, woman's suffrage, and trusts. When it was found that the members of the legislature were not always disinterested, a monthly town meeting was substituted. In all other respects the village is a copy in miniature of the outside world with its trade, commerce, and industries. The citizens are drawn from all classes; boys and girls committed by sentence of a court, wayward juveniles sent by their parents, boys and girls who come voluntarily to the Republic to find there a start which is so difficult for them outside. But there are no distinctions of class; all must work to support themselves or be maintained in the workhouse or jail, where they are compelled to labor. The chief industries of the Republic are farming, carpentry, plumbing, printing, baking, road-mending and building, laundry and domestic work for the girls. The community is housed in ten cottages and hotels, and is provided with board and lodging according to their means. There is a special currency and a bank; the savings may be redeemed in United States currency on leaving the village. A school is maintained which provides instruction up to college entrance requirements. There is a chapel in which each denomination has its own service. An interesting feature of the Republic is the court in which offenders are tried by a jury of their peers; the judge is an elected officer. Law-breakers may be fined or imprisoned in the jail which adjoins the court. Mr. George attributes the success of the experiment to the absence of an adult-manufactured system. Those characteristics which mark boy and girl life generally are seized upon as the foundation. There is no adult interference with the exception that the larger industrial undertakings are in the charge of adult and experienced helpers, while the spirit of home life is introduced into the cottages by the presence of adult proprietors. The institution is maintained through payment for board by parents, guardians, societies, or county officials, annual contributions, a small endowment, payment towards teachers' salaries from the State Education Department, and income from sales of products made by the citizens. The success of the institution is evidenced by the fact that of those who have been through the Republic only about two per cent have turned out to be failures, while the rest are to be found in all walks of life, a few having proceeded to Cornell, Harvard, Columbia, and other colleges.

In 1908 the National Association of Junior Republics was formed to encourage the establishment of republics in other parts of the country. The Carter Republic at Redington, Pa., and the National Republic at Annapolis Junction, Md., may be mentioned as carrying out work on the same principle as the George Junior Republic.

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GEORGE WASHINGTON UNIVERSITY, WASHINGTON, D.C. — The successor of the Columbian College of the District of Columbia, an institution chartered by Congress on Feb. 9, 1821. On March 3, 1873, the name was changed to the Columbian University and on Jan. 23, 1904, to The George Washington University. The old Columbian College was organized and controlled by the Baptist denomination. In 1898 the sectarian control was modified, the president and two thirds of the trustees remaining Baptist. In 1904 with the adoption of its present name the institution became nonsectarian. Its present board of trustees is a self-perpetuating body of twenty-two members, divided into three classes, seven trustees being elected each year. The university has a department of arts and sciences — consisting of the graduate school, the College of Arts and Sciences, the College of Engineering and Mechanic Arts, the College of the Political Sciences, and Teachers College — and professional departments of law, medicine, and dentistry. Also it embraces the National College of Pharmacy and the College of Veterinary Medicine, institutions organized under its charter as separate corporations with independent financial foundations but educationally parts of the university. The endowment of the university has through past administration been greatly impaired, the loss in it being now covered adequately but unproductively by a deed of trust on the medical school and the hospital buildings. The university is therefore to a great extent dependent financially on tuition fees and subscriptions pledged by friends. The instructing staff, 1910–1911, numbered 176, but in many instances members of it give only part time to the university. The students, 1910–1911, were 1277, divided, including 13 duplicates, as follows: Graduate School 54, College of Arts and Sciences 281, College of Engineering and Mechanic Arts 176, College of the Political Sciences 77, Teachers College 93; Department of Law 343, Department of Medicine 98, Department of Dentistry 40, National College of Pharmacy 63, College of Veterinary Medicine 65. C. H. S.

GEORGETOWN COLLEGE, GEORGETOWN, KY. — A coeducational institution established in 1829 under the auspices of the Kentucky Baptist Education Society. Preparatory and collegiate departments are maintained. The entrance requirements are equivalent to some twelve points of high school work. Degrees of Bachelor of Arts and Bachelor of Science are conferred on completion of the requirements, which include at least one year of work in residence. There is a faculty of twenty members in the college.

GEORGETOWN UNIVERSITY, WASHINGTON, D.C. — See Jesus, Society of, Educational Work of.

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GEORGIA, STATE OF. — The southernmost of the original thirteen states. Ratified the Federal constitution in 1788. It is located in the South Atlantic Division, and has a land area of 58,980 square miles. In size, it is nearly equal to the six New England States. For administrative purposes it is divided into 145 counties, and these are in turn divided into cities and school districts. In 1910 Georgia had a population of 2,609,121, with a distribution of 44.4 persons per square mile.

Educational History. — In laying out the original towns, considerable bodies of land were set aside by the trustees of the colony for the support of church and school. Schools were maintained by the trustees and charitable friends of the colony, at Savannah and elsewhere. In 1754 the crown took over the colony and agreed to continue the "allowance heretofore usually given by the trustees to a Minister and two school-masters." The agreement so made was kept until the Revolution, the only case on record where the Parliament of England supported schools in the colonies. The most notable educational activity in the colony was the orphan house founded in 1739 by the evangelist George Whitefield (*q.v.*), upon which he had expended by 1764 some £12,000 sterling. This institution was in avowed imitation of Francke's orphan house at Halle, and in it were taught such trades as carpentering, weaving, and tailoring.

The Society for the Propagation of the Gospel (*q.v.*) also gave some assistance to schools in the colonial days.

The first educational interest of the state as such was in a system of county academies. The constitution of 1777 provided that "schools shall be erected in each county, and supported at the general expense of the state as the legislature shall hereafter point out." As soon as the Revolution was ended, the legislature chartered (1783) academies for three of the counties, giving to each a landed endowment, and granted further " one thousand acres of vacant land for erecting free schools " in each of the remaining counties. The " free schools " here contemplated were of the county academy type. In 1792 the land endowment was changed to £1000 worth of confiscated property; a provision which remained in force until 1835.

The county academies were, in 1785, formed into an administrative system under the newly created state university. In 1784 (Feb. 20) a state " college or seminary of learning " had been chartered and endowed with 40,000 acres of land, being thus the first chartered of American state universities. (See Georgia, University of.) In 1785 this charter was enlarged so as to include " as parts or members of the university all public schools instituted or to be supported by funds or public moneys." The Senatus Academicus of the university was required to advise " not only upon the affairs of the university, but also to remedy the defects and advance the interests of literature through the state in general." In pursuance of this end it should " recommend what kind of schools and academies shall be instituted, agreeably to the constitution, in the several parts of the state, and prescribe what branches of education shall be taught and inculcated "; should " also examine and recommend the instructors to be employed in them, or appoint persons for that purpose." The president of the university was required to visit the schools regularly and " examine into their order and performances." This plan, remarkable both for its inclusiveness and for its centralization of authority, was in these respects never much more than a legislative dream. The university did not begin work until 1800; the county academies were too widely scattered and the frontier spirit of freedom too strong to allow a central body to exercise real control. By 1820 thirty-one academies had been chartered. In 1821 an " academic fund " of $250,000 was set aside, the income of which should be divided among the counties. The quota of any county should normally go to the county academy; but it might by special enactment be divided among certain authorized academies in the county, or be given to elementary education (poor school fund). The effect of this " academic fund " appears in the fact that during the next ten years more than three times as many academies were chartered (107) as in the preceding forty years; while the next decade (1830–1840) saw this number more than doubled (256). The " academic fund " was in 1837 transferred to the " common school fund," and the chartering of academies shows an immediate decline. Some of these academies from the first had "female departments"; and beginning about 1825 a number of distinctly " female academies " were chartered. In the smaller places, however, coeducation was the rule. A curriculum of 1806, probably typical of the best, included " English, Latin, and Greek, writing, arithmetic, geography, astronomy, mathematics, and Roman antiquities." Later, elementary education received increased attention in the academies, which thus formed until the Civil War the chief dependence of the state for education.

Prior to the Civil War free schooling was, for the most part, confined to the poor and given to them as a charity from state and county " poor school funds." In 1817 $250,000 was set aside by the state " for the future establishment and support of free schools throughout the state." The next year lots 10 and 100 of each " surveyor's district " in about one third of the state were reserved " for the education of poor children." In 1822 the income from these funds was directed towards paying the tuition of any poor child in whatever school he might chance to be. Special schools were neither established nor contemplated. The working of this plan was at no time satisfactory, and many efforts were made to improve it. When the "surplus revenue" was received from Congress in 1836, one third (about $350,000) was set aside for school purposes, and a committee was appointed to visit the various sections of the country " particularly the New England states " and report a plan of " common schools." As a result there was adopted in 1837 a thorough system of schools, free to all white children and supported from the income of a " common school fund " (of nearly $1,000,000), this to be supplemented by a county tax (amendment of 1838), if locally desired. Whether the scheme was too radical a step or whether the panic of 1837 was too disastrous, does not now appear; but in 1840 the " common school " system gave place to a renewal of the " poor school fund " plan. This was improved in 1843, 1849, and in 1852.

Parallel with this general state law were to be found various local efforts. Savannah from 1818 and Augusta from 1821 had " free school societies affording education to the children of indigent parents." These were supported in part by state and county funds. Glynn (1823) and Emanuel (1824) counties had free schools for needy children; Gwinnett (1826) " for the education of the youth of the county." McIntosh county in 1830 had a free moving school. The " academy funds " were in several instances used in connection with such free school systems. These local efforts continued more or less sporadically until the permanent establishment of a common school system in 1870.

In 1845 and again in 1856 efforts were made before the legislature to establish a general system of free schools; but not before 1858 was any real progress made. In that year there was elected as governor a man from the plain people, through whose influence the school fund was much enlarged with provision for its further increase, and an annual appropriation of $100,000 was made " for the education of the children of this state." This marks the disappearance of the word " poor " from his legislative enactments. By this act each county was to adopt its own school plan; and a county tax was authorized. The next year county boards of education were provided to disburse the funds and examine teachers. As a result of these acts a number of counties organized common free school systems. The war of course stopped this development; but the constitutional convention of 1861 added to the general educational provision, which has been in force since 1798, a clause authorizing the General Assembly " to provide for the education of the people." This clause was retained in the constitution of 1865 (contrary to the statement in Barnard's *American Journal*).

Immediately after the war and before the radical Reconstruction was begun, the legislature adopted (1866) an act establishing a " general system of Georgia schools " in which was provided a state " superintendent of public education," free schooling for all white children, local taxation to supplement state funds, and in general, all the machinery for an efficient public school system. The scheme was to go into effect in 1868. Before that time Congress overturned the existing state government, and placed in power the radical reconstructionists. In 1868 the constitutional convention (more than half of whom were Southern whites) adopted without division an explicit provision for " a thorough system of general education to be forever free to all children of the state." For the first time in the state schooling was provided for the negro.

In 1869 the State Teachers' Association was formed, and this body practically outlined the school law of 1870, which was the first public free-school law passed under the new constitution. The new school system did not escape the mismanagement which characterized the reconstruction period, the school funds were diverted and spent, a large debt was contracted, and as a result, the schools were closed during the year 1872. In 1872 the school law was revised and amended, and this law has formed the basis of the present school system for the state. In 1877 another new constitution was adopted, and, in this, still more explicit instructions were laid down with reference to education. New provisions with reference to state and county taxation for schools were inserted, separate schools for the two races were required, the local school systems in existence were legalized, and an additional mandate was laid upon the legislature to provide " a thorough system of common schools," " as nearly uniform as practicable," for the education of the children of the state. Side by side with this general school system, established by the law of 1870, there has grown up a series of special school systems, regulated and controlled by local laws. Chatham County (in which is Savannah) was the first to have a separate system, followed closely by the city of Columbus, both being created in 1866. In the same year as the new school law, 1870, Atlanta was created a special school system; Richmond and Bibb Counties following in 1872; Glynn County in 1873. Other cities followed, until practically every town of any size has its local system. Local taxation elsewhere practically forbidden, was possible in these local systems and has been the chief incentive to their formation. Some of the best schools of the South are to be found in the counties and cities of Georgia operating under local and independent laws.

In 1887 the school law was revised, and a number of important changes made. The preparation of all questions for teachers' examinations was placed with the State School Commissioner; the election of teachers by county boards was changed so as to give them discretionary power in elections, instead of being required to elect those nominated by the district trustees; the boards of district trustees were abolished, and the county was made the unit in administration. The state appropriations have been gradually increased until now $2,500,000 is annually disbursed from the state treasury. In 1891 a State Normal School was established by legislative act, and county teachers' institutes were created. In 1903 the State Board of Education was created a State Textbook Commission as well, with power to adopt a uniform series of textbooks for the schools of the state. In 1904 the state constitution was amended so as to make feasible the levying of county and district school taxes, and this permission has been made use of by many of the counties and districts since that time. In 1906 eleven agricultural high schools were established, one in each congressional district, for instruction in agricultural science. In 1906 the school districts were re-created and trustees appointed, and, in 1905, local district taxation for schools was established for the first time.

In 1910 constitutional provision was, for the first time, made for the state support of secondary education. The next year (1911) provision was made for state inspectors of elementary schools; and the state school board was changed from an *ex officio* body of statehouse officers to a body appointed by the governor, while the power of the board was much increased.

Present School System. — The school system of Georgia, as at present organized, is as follows: At the head of the system is a State Board of Education and a State Superintendent of Schools. The State Board of Education is a body composed of the Governor, the State Superintendent of Schools, and four others appointed by the Governor. The Governor is president, and the State Superintendent of

Schools is the chief executive officer of the Board. The Board regulates the supervision of all schools in the state, supervises all certification of teachers for all public schools, provides the course of study for all common and high schools receiving state aid, adopts uniform textbooks, and acts as a court of final appeal from the decisions of the state superintendent. Counties, cities, and towns that levy a local tax for schools and maintain a term of eight months are exempt from the provisions of the law requiring uniformity in textbooks. The State Superintendent of Schools is elected by the people for two-year periods and receives a salary of $3000 a year. He has " a general superintendence of the business relating to the common schools of the state," and is " charged with the administration of the school laws." He prepares blank report forms, visits the different counties, and examines into the administration of the school law, delivers popular addresses in the interests of education, and makes an annual report to the General Assembly. He is also a member of the State Geological Board. There are three state school supervisors appointed by the state Superintendent, who under his direction hold teachers' institutes, grade papers for state licenses, and " aid generally in supervising, systematizing, and improving the schools of the state."

In each county there is a county board of education and a county superintendent of education. The County Board, except in the four special systems of Bibb, Chatham, Richmond, and Glynn, consists of five freeholders appointed by the grand jury of the county, for four-year terms, and removable for cause by the county judge. They receive $2 per day for their services, and are required to lay off their counties into school districts, to establish at least one school for white and one for colored children in each, to employ the teachers for the schools, to fix the time and length of the school term, and to act as a judicial tribunal for school affairs in the county. The board may also disapprove of any district trustee elected, and order a new election. The county superintendent of education, is chosen by popular election from among the citizens of the county, for a four-year term, and acts *ex officio* as secretary of the board. He acts further as a medium of communication between state and district officers; must visit each school in the county at least once every sixty days; acts as the agent of the county board in purchasing furniture and supplies; makes an annual report to the grand jury and a monthly report to the State Superintendent of Schools; issues certificates to school trustees; and examines teachers for licenses. The minimum salary for this office is $600 per annum, but the county board may make such additional compensation, " as may be in their judgment proper and just." County boards may employ him to take the school census, for which he may be paid $2 a day.

Each county, not under local laws, is divided into school districts of at least sixteen square miles, though smaller districts may be laid off if conditions require it. For each district, three trustees are elected for three-year terms, one each year. In incorporated towns, five trustees are elected for three-year terms. These boards of trustees are to supervise the school operations in their districts, may make recommendations to the county board as to their choice for teachers, and must make an annual report to the county board. In districts which vote a local district tax, the boards of trustees may make all rules and regulations for the government of the schools, may build and equip their schoolhouses, subject to the approval of the county board, and may fix the salaries of their teachers. Any city of over 2000 inhabitants may organize an independent school system and report direct to the State School Commissioner, and any county may be so organized by an act of the General Assembly. Such independent systems make their own course of study, and may by permission of the state board certificate their own teachers.

School Support. — The state appropriation constitutes about 65 per cent of the total school revenue for the state, and is apportioned to the counties and local systems on the sole basis of the number of children 6–18 years of age. In each county not operating under special laws, an election to vote a county tax may be called by a petition signed by one fourth of the voters, and a two-thirds majority of those voting enacts the tax. The county board determines the amount, not to exceed five mills. By a similar petition and election, any district may vote a similar district tax, the local board of trustees determining the amount up to five mills. A considerable amount is still contributed from private sources, and in some districts a species of the rate tax is still allowed, by common consent, in the form of a small incidental fee to cover the cost of school supplies, fuel, and janitor service, though pupils who are unable to pay are excused from the fee, and the courts do not recognize the right of the districts to exact the fee.

Educational Conditions. — Of the population of 1910, 45.1 per cent were negroes and 99 per cent were native born. But three states (Louisiana, Mississippi, and South Carolina) have a larger percentage of negroes in the total population. In one half of the counties the blacks outnumber the whites, and in one fourth of the counties they outnumber the whites two or more to one. The percentage of children, 5–18 years of age, in the total population (33.4 per cent), is high, being larger in but four states, and all of these in the South. While the state has made rapid advances in manufacturing within recent years, it is still largely an agricultural state, as 84.4 per cent of the total population live in rural districts, and but 11 per cent in cities of over 8000 inhabitants.

In illiteracy, Georgia stood sixth in 1900 in its percentage of the total population, ten years or over, who were illiterate. By race, the state stood third in illiteracy for the negro population and ninth for the white population, and by percentage, 11.9 per cent of the whites and 52.4 per cent of the negroes were illiterate. There was little difference in illiteracy between the sexes. But 1.1 per cent of the total population of the state was of foreign birth.

Outside of the towns and cities, the state has little material equipment for the work of education. The average value of all publicly owned schoolhouses in the state during the last year for which statistics are available was about $1800. Much of the money for repairs and for new buildings in the rural districts is raised by private subscription. The school term, too, is commonly lengthened by the same means, many communities providing what are called long-term schools by private subscription. The subject matter of instruction embraces agriculture, civil government, and physiology and hygiene, in addition to the common school branches. The State Board of Education adopts a uniform system of textbooks for the schools of the state, but counties, cities, and towns that levy a tax for graded schools and maintain an eight-months school are not required to use the uniform series. Each county board is authorized by law to establish one or more manual labor schools, but such schools must be self-sustaining. As in Alabama, the elementary school system of Georgia is just now being rounded out and classified.

Teachers and Training. — For the training of future teachers, the state maintains or helps to maintain four institutions, one of which is for the colored race, and there are also three private normal and industrial schools, all of which are for the colored race. Of the state schools, the Georgia Normal and Industrial College for whites at Milledgeville, and the Georgia State Industrial College for negroes at Savannah, are partly normal and partly industrial institutions, and of a type common in the South. The law of the state still authorizes two forms of teachers' contracts, one the usual form by the month, and the other where payments are made to private school teachers who take public school pupils at a certain rate based on enrollment and attendance, and thus conduct a long-term school. The wages of the teachers are low.

Secondary Education. — Georgia has its high school system better developed than any of the neighboring Southern States, the state reporting 231 public and 48 private high schools. Of the public high schools, 12 were in cities of 8000 inhabitants or over, while 219 were in smaller places. Six of the total number of high schools were for the colored race. The state has recently (1910) authorized state aid to high schools, such aid having been expressly forbidden by the Constitution of 1877. With the development of the agricultural and natural resources of the state, and the consequent increase in the amount of money available for education, conditions may be expected to improve very rapidly.

Higher and Technical Education. — The University of Georgia (*q.v.*) at Athens, founded in 1784 and opened in 1800; the Georgia State College of Agriculture and Mechanical Arts, also at Athens, and opened in 1872; the Georgia School of Technology, at Atlanta, opened in 1888; and the North Georgia Agricultural College at Dahlonega, opened in 1872, stand at the culmination of the public school system of the state. The Georgia State Industrial College, at Savannah, offers somewhat similar instruction for the colored race. Georgia has a large number of colleges, nearly all denominational, some of them for the negro race, which offer preparatory and collegiate instruction. Few of them have much endowment or high standards. The state also maintains the Georgia Academy for the Blind, at Macon; the Georgia School for the Deaf at Cave Spring; the Georgia Normal and Industrial College for girls, at Milledgeville; and eleven district agricultural schools for the teaching of the elements of agriculture. The Normal and Industrial College is one of a type of institutions found in the South, which offers training to girls along vocational, industrial, normal, and musical and artistic lines.

W. H. K. and E. P. C.

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GEORGIA, UNIVERSITY OF, ATHENS, GA. — The earliest state university in the United States, chartered in February, 1784, while the University of the state of New York received its charter in May, 1784. By the amended charter of 1785 all public education in Georgia was made a part of the University (see GEORGIA, STATE OF). The early studies provided in the University were mainly literary, and only the arts degree was conferred. The land grants made by Congress in 1862 made the establishment of the Georgia State College of Agriculture and the Mechanical Arts and the provision of modern scientific studies possible. In 1867 the Lumpkin Law School was incorporated as a department of the University;

the North Georgia Agricultural College followed in 1872; and in 1873 the Georgia Medical College at Augusta became a department of the University. The following institutions are also branches or departments of the University: Georgia School of Technology at Atlanta, 1885; Georgia Normal and Industrial College for Girls at Milledgeville, 1889; Georgia Industrial School for Colored Youth at Savannah, 1890; and the State Normal School, near Athens, 1895. More recent extensions are the School of Pharmacy, 1903; the Summer School, 1904; Georgia State College of Agriculture; the School of Forestry, 1906; and the School of Education, 1908. Franklin College is the college of arts. The government of the University is in the hands of a Board of Trustees appointed by the Governor. The support comes from state taxation, federal grants, and private gifts. The University campus extends over an area of 132 acres, and the University farm covers 830 acres. The main building equipment comprises fifteen buildings. The admission requirements are fourteen units, four conditions being allowed. The degrees of Bachelor of Arts, Bachelor of Science, Bachelor of Science in Civil Engineering or Agriculture, Bachelor of Law (after a two years' course), are conferred on completion of the appropriate courses. Degrees are also conferred by some of the affiliated institutions, as the North Georgia Agricultural College, the Medical College, the Georgia School of Technology. The enrollment of students at Athens in 1910–11 was 940; distributed as follows: graduate school, 7; college, 180; science and engineering, 176; agriculture, 223; law, 55; pharmacy, 19; summer school, 337. The University at Athens has a faculty of 46 members, of whom 25 are professors and 9 adjunct professors. David Crenshaw Barrow, LL.D., is the chancellor.

GERBERT, or GERBERTUS. — One of the most remarkable scholars of the Middle Ages, and a man who had a marked influence upon mathematical instruction. He was born at or near Aurillac, about 950. Richer, his pupil and friend, to whom we are indebted for most of our knowledge of his life, speaks of him as an Aquitanian, and relates that as a child he entered the monastery of Saint Gérauld. Other writers speak of his family as being related to royalty, but in spite of careful research his parentage still remains obscure. He seems to have been a brilliant student, and one of agreeable manner and without forwardness. In 967 Borel, Comte d'Argel, lately become lord of Barcelona, visited Aurillac and saw the youthful Gerbert. The abbot, informed by Borel that Spain at that time had a number of distinguished scholars, confided Gerbert to him in order that the boy might acquire the learning of that country. Borel gave Gerbert into the charge of Hatton, Bishop of Vich, under whom, Richer tells us, " he made rapid progress, particularly in mathematics." Gerbert remained three years in Barcelona, and in this time he may possibly have learned the Hindu-Arabic numerals (see Notation), since he knew something of them later in life. After this sojourn he accompanied Borel and Hatton to Rome, where in 970 he was presented to Pope John XIII. The Pope was so pleased with the young monk's proficiency in music and astronomy that he spoke of him to Otho I, a monarch with great interest in education, although himself illiterate. Through these circumstances and by means of his natural abilities, Gerbert obtained the favor of both Pope and emperor, and in 972, at his request, he was allowed to go to Rheims with the archdeacon Garamnus in order to study logic under this scholar. The diocese of Rheims at that time possessed 700 cures and 23 monasteries, the most important of the latter being that of St. Denis. Here it was that Gerbert carried on his later studies, and here he made a brilliant reputation as a teacher. His chief work in the lecture hall was in rhetoric, but he acquired a great renown as an arithmetician from his use of a special form of the abacus (*q.v.*), a form that may have been invented by him. He also used certain numerals known as the apices (see Notation), forms that are often attributed to Boethius (*q.v.*). He also had a great reputation for his work in astronomy, which subject he taught at Rheims. After a brilliant period of teaching in this monastery he was made abbot at Bobbio (982), one of the most important church positions in Italy, and nine years later (991) he became Archbishop of Rheims. In 998 he became Archbishop of Ravenna, and a year later he was elevated to the papal chair as Sylvester II. He reigned as Pope only four years, dying on May 12, 1003. His mathematical works include a treatise on the abacus, a work *De numerorum divisione*, and a work *De geometria*. D. E. S.

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GERBERT, MARTIN, BARON OF HORNAU AND PRINCE-ABBOT OF ST. BLAISE (1720–1793). — One of the most learned and saintly Roman Catholic prelates of the eighteenth century. He was educated at the Jesuit College at Freiburg and in the cloister of St. Blaise and enriched his mind by varied culture and by travels, from which he brought back abundant spoil of Mss. from the libraries of Europe. Historical research, especially in music, was his favorite pursuit. He formed relations with learned societies everywhere, and made many important discoveries in this field. His treatise *De Cantu et Musica* was published in two volumes in 1774 and has ever since formed the basis of all musical scholarship. The *Scriptores Ecclesiastici de Musica Sacra* (1784) created a sensation in the musical world and was of the highest value for the study of music. It was a collection of all the ancient authors who had written upon musical subjects from the third century to the invention of printing and whose works had remained in manuscript and were for the most part unknown. W. R.

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Catholic Encyclopedia, s.v. *Gerbert*.

GERBIER, SIR BALTHAZAR (?1591–1667). — Painter, architect, and courtier. He devised schemes for the education of noblemen and gentlemen's sons in an Academy in Bethnal Green. Gerbier was a Dutchman and came to England in 1616 and entered the service of George Villiers, afterwards Duke of Buckingham. In 1631 Gerbier was King Charles I's agent at Brussels and in 1641 Master of the Ceremonies. He issued prospectuses, June 28, 1648, and in 1649 on June 18, August 4, October 31. The prospectus for June 28, 1648, is addressed to "all Fathers of Noble Families and lovers of Virtue," in which he stated he was founding an Academy in which would be taught French, Italian, Spanish, German, and Low Dutch, both ancient and modern histories, jointly with the constitution and government of the most famous empires and estates of the world. Courses were given in experimental Natural Philosophy, mathematics, including arithmetic, bookkeeping "by double parties," geometry, geography, cosmography, perspective, and architecture, practical mathematics, to include fortification, besieging, and defending of places, fireworks, ordering of battalia, and marches of arms; music, playing of all sorts of instruments, dancing, fencing, riding the erect horse, together with the new manner of fighting on horseback. Permission was also to be made for teaching drawing, painting, limning, and carving. Gerbier announced that he was himself preparing treatises for the study of modern languages. He was also prepared to lodge the sons of gentlemen in his own house at Bethnal Green. He thus promises to parents an education for their sons at home in England, similar to what they could get in academies abroad and the avoidance of the "dangers and inconveniences" of education abroad, "in these evil times." In the prospectus of August 4, 1649, Gerbier provides a time-table. The regulations are modeled to some extent on those of Sir Francis Kinaston's (*q.v.*) *Musaeum Minervae*. On December 21, 1649, he issued a notice that ladies might attend his lectures, and adventurer as he was, he is probably to be credited with being the first in England to encourage the idea of men and women attending academic lectures together. F. W.

See Gentry and Nobles, Education of; Academies, Courtly.

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GERMAN INFLUENCE ON AMERICAN EDUCATION. — German educational ideas and methods have profoundly influenced all parts of the American system of education, but especially its top and its foundation, the university and the elementary school, including the kindergarten, both of which have been either created or fashioned on the model of the corresponding German institutions.

This influence has been exerted through five different channels, which, of course, frequently run into one another and cannot be entirely separated, namely, (*a*) through the work of German-Americans and of German-American schools; (*b*) through American students educated in German universities (see *Rep. U. S. Com. Ed.*, 1897–1898, Vol. I, pp. 610–613); (*c*) through reports on German education published by American and other visitors of German schools; (*d*) through the study of German pedagogy, psychology, and philosophy on the part of Americans in this country; and (*e*) through the work of German lecturers brought over either as exchange professors or by invitation of such bodies as the Germanistic Society of America (*q.v.*).

Of these, the direct influence of German-Americans and of the German-American schools has been comparatively small, certainly not so great as might have been expected, considering the numerical proportion of the German element, which is estimated at about 27 per cent of the total population. The chief reason for this lack of direct influence lies probably in the difference of language, which separated the German-American schools from the main current of national education, and also in the fact that nearly all of these schools were either private or parochial schools. Still a large number of German-American teachers have played an important part in American education. Among these are Franz Daniel Pastorius (1651–1719), the first German teacher in America, the founder of Germantown; Carl Follen (1795–1840), the first professor of the German language in Harvard; Francis Lieber (1800–1872), who introduced gymnastic training into Boston and afterwards became one of the greatest jurists of America; H. E. von Holst, the author of the *Constitutional History of the United States;* William N. Hailmann, superintendent of public schools at La Porte, Ind. (1883–1894), afterwards national superintendent of Indian Schools; and many others. What was perhaps the earliest book of a pedagogical nature to appear in this country was from the pen of a German, Christopher Dock (*q.v.*), a master of one of the early Pennsylvania schools. (See PENNSYLVANIA, STATE OF; PAROCHIAL SCHOOL SYSTEM.)

Among the first American students matriculated in German universities were George Tichnor, Edward Everett, George Bancroft, and Joseph G. Cogswell, all of whom studied in the University of Göttingen. Everett was the first American who received a Ph.D. degree from a German university (1819). Previous to this, Benjamin Smith Barton, of Lancaster, Pa., had obtained the degree of Doctor of Medicine from the same university (1799). Bancroft and Cogswell founded (1823) the Round Hill School, near Northampton, Mass., the first school in this country thoroughly impressed with the German ideas. During the remaining part of the nineteenth century and up to the present an increasing number of American students have pursued advanced studies at Göttingen, Berlin, Halle, and later on also at Leipzig, Bonn, Heidelberg, Jena, and other German universities. Hundreds of these have become professors in American colleges and have transplanted German ideas of advanced instruction and German methods of research upon American soil. Through their students in the graduate departments of universities and colleges this influence has been very widely extended. The foundation of Johns Hopkins University in 1876 marks an epoch in American university education. This institution was, in its fundamental ideas, largely modeled on the pattern of the German university, and most of its early professors had been students in Germany. (See COLLEGE, AMERICAN; UNIVERSITIES, AMERICAN.)

The most important reports on German education which influenced American schools were those of John Griscom (*q.v.*) (1819), Alexander D. Bache (*q.v.*), and C. E. Stowe (*q.v.*) (1833), but particularly that of Victor Cousin (*q.v.*) (1831), which was translated into English, and published in the United States in 1835. The American publication of Cousin's work proved to be of enormous influence on education in the Middle West. Equally important was the famous *Seventh Annual Report* of Horace Mann (1843), which, among other things, called special attention to the methods of the Prussian normal schools.

The study of German literature and philosophy among English-speaking peoples may largely be traced back to the influence of Coleridge and Carlyle. In America these studies received an impetus through Emerson, Theodore Parker, Margaret Fuller, Frederick H. Hedge, Henry Barnard, William T. Harris, Elizabeth Peabody, Charles De Garmo, and others. Barnard, in his *Journal of Education*, published translations from Karl von Raumer's *History of Pedagogy;* Harris studied the philosophical system of Hegel and the pedagogical philosophy of Karl Rosenkranz; Miss Peabody became an enthusiastic follower of Froebel and founded (1867) the American Froebel Union; Charles De Garmo, the McMurrys, and others, introduced American teachers to the pedagogy and philosophy of Herbart.

The custom of bringing over German lecturers on educational subjects is of recent origin, so that the results of this activity still lie with the future. Yet an important influence may be expected at least in two directions, namely, towards vocational training, through the work of the Munich school superintendent, Dr. Georg Kerschensteiner, and towards the improvement in teaching modern foreign languages through the inspiration given by Dr. Max Walter, director of the Musterschule in Frankfort a. M. F. M.

See under separate titles for further account of the persons mentioned in this article; esp., PESTALOZZIAN MOVEMENT IN AMERICA; MANUAL LABOR INSTITUTIONS; FELLENBERG; FROEBEL; KINDERGARTEN; COLONIAL PERIOD IN AMERICAN EDUCATION; etc.

GERMAN INFLUENCE ON ENGLISH EDUCATION. — At the time of the Reformation, German influence, commingled with that of Erasmus, Calvin, and Sturm, made a deep and lasting impression upon the course of study in English schools and upon the English idea of the relation between the state and education. Luther's *Schrift an die Rathsherren aller Städte Deutschlands, dass sie Christliche Schulen aufrichten und halten sollen*, written in 1524, had its echo in the preamble to the Chantry Act passed in the first year of King Edward VI (1547), and in the Constitutions and Canons Ecclesiastical of the Church of England, 1603, especially Canons LIX and LXXVII–LXXIX. There are traces of the same influence in English Poor Law administration as early as the reign of Elizabeth and prior to the Poor Law Relief Act of 1601, which first recognized the public obligation to supply elementary education in the case of the children of the destitute poor. In the curriculum of the English Grammar Schools the educational influence of Melanchthon (*q.v.*), combined with that of Maturin Cordier (*q.v.*) of Geneva, is clear, especially in the emphasis which was laid upon religious instruction as a dominant feature in the course of training.

The influence of Protestant Germany was deepened in English education in the seventeenth century by the study of the works of Comenius (*q.v.*), and especially of his *Great Didactic* (first published in Latin, 1657), and of the *Januae Linguarum Vestibulum* (English translation, 1647) and *Orbis Pictus* (1657). At the invitation of his friend, Samuel Hartlib, Comenius visited England in 1641, and, if the disturbed political condition of the country had not prevented it, might well have been engaged to take a leading part in the reorganization of English education. Comenius's work was well known to Milton, and he is referred to in the latter's *Tractate on Education* (1644) as "a person sent hither by some good Providence from a far country to be the occasion and the incitement of great good to this island." The Civil War, however, and the reactionary tendencies of the Restoration period prevented the influence of Comenius from bearing full fruit in the educational life of England.

In the last years of the seventeenth century, 1698–1699, Dr. Bray (*q.v.*) and his associates established a *Society for Propagating Christian Knowledge* (*q.v.*), one main purpose of which was "to set up catechetical schools for the education of poor children in reading and writing, and more especially in the principles of the Christian religion." In the movement for the reformation of English morals and for the establishment of charity schools (*q.v.*), the influence of the German Pietists was strong. August Hermann Francke (*q.v.*) was asked to send over two Germans to help in the setting up of Charity Schools, and these two visitors attended a meeting of the Society on May 11, 1699, to give an account of the school which had been erected at Halle by A. H. Francke, who was at the same meeting chosen a corresponding member of the Society.

The educational efforts of John Wesley (1703–1791), especially during the years 1742 onwards, were greatly influenced by what he saw among the Moravians during his visit to Herrnhut in 1738. The Moravian polity, influenced by Pietism (*q.v*), made the Orphan House, which aimed at giving a Christian education to boys and girls, an essential part of the organization of the Church. From 1760 Moravian schools in England have exercised a quiet but beneficial influence in English education.

The next great wave of German influence came into English education through S. T. Coleridge, who, in 1830, in his essay on *The Constitution of the Church and State according to the Idea of Each*, echoed the teaching of Fichte (*q.v.*) that the aim of statesmen should be "to form and train up the people of the country to obedient, free, useful, and organizable subjects, citizens and patriots, living to the benefit of the state and prepared to die in its defence." Throughout the great speeches on education made in the English Parliament by Brougham (*q.v.*), Roebuck, and others during the years 1833–1835, German precedent for compulsory education was quoted as a convincing proof of the practicability of making elementary instruction obligatory by law. After Coleridge, Thomas Carlyle (*q.v.*) did much to familiarize the English public with German ideals of state-organized education, especially in *Past and Present* (1843) and in *Latter-Day Pamphlets* (1850). It was, however, through Albert, the Prince Consort (who married Queen Victoria in 1840), that enlightened German ideas as to the action of the state in public education became most widely extended in England. During the twenty-one years of his residence in England, Prince Albert succeeded, with the help of Lyon Playfair and others, in developing the State Department of Art and Science and in promoting wise extensions of state activity in elementary and technical education.

The success of the Prussian army in the war with Austria in 1866 drew attention to the military and social value of the intelligence and discipline which had been diffused throughout the German people by the elaborate organization of state-aided schools. The impression thus produced upon the public mind was one factor which led to the carrying of the Elementary Education Act in 1870 and to the subsequent adoption in 1876 of the principle of compulsory education. (See ENGLAND, EDUCATION IN.)

Since that time German influence in English education has been persistent and penetrating. At every point German methods have been investigated and German precedents quoted. Of all English writers, Matthew Arnold (*q.v.*) was the most successful in attracting the attention of responsible English administrators and statesmen to the value of the German methods of educational organization. Since 1880 German influence has consequently been noteworthy in English policy as regards secondary education, technical instruction, and university development. The latest illustration of the same influence is found in the movement for the enforcement of attendance at continuation schools, part of the Scottish Act of 1908 having been avowedly modeled to some extent on German precedent, and the latter being constantly quoted in favor of the adoption of a similar policy in England.

In four respects German influence has been especially strong in English education. (1) From the Reformation to the present time it has tended to strengthen the view that religious teaching should be part of the regular curriculum of state-aided elementary and secondary schools. (2) Throughout the nineteenth century it has supported the idea that the state should take an effective and, indeed, determinative, part in the regulation of all grades of national education. (3) It has stimulated in the highest degree the scientific study of methods of teaching and of the philosophy of education. (4) It has secured general acceptance for the view that the state can help in developing the economic prosperity of a nation by the systematic encouragement of technical and commercial instruction. M. E. S.

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GERMAN LANGUAGE AND LITERATURE IN THE SCHOOLS. — See Modern Languages and Literatures in the Schools.

GERMAN WALLACE COLLEGE AND NAST THEOLOGICAL SEMINARY, BEREA, OHIO. — See Deutsche Wallace Kollegium.

GERMANISTIC SOCIETY OF AMERICA, THE. — Organized in New York City in 1904 to promote the knowledge and study of German civilization in America and of American civilization in Germany, by supporting university instruction in these subjects, by arranging public lectures, by publishing and distributing documents, and by other means adapted to the ends for which the Society is established. In accordance with this program a lectureship on the History of German Civilization has been maintained at Columbia University since 1905, while during the first term of the academic year 1907–1908 a similar course of lectures was delivered at Yale University. Other German scholars and authors invited by the Society to lecture in New York and other cities before colleges and universities and German societies include Professor Friedrich Delitzsch, Berlin; Dr. Ludwig Fulda, Berlin; Professor Otto Hoetzsch, Posen; Professor Hermann Anders Krüger, Hanover; Dr. Carl Hauptmann, Mittel-Schreiberhau; Professor Max Friedlaender, Berlin; Professor Rudolf Lehmann, Posen; Ernst von Wolzogen, Darmstadt; Professor Wilhelm Paszkowski, Berlin; and Rudolf Herzog, Rheinbreitbach. Similarly a number of American scholars have lectured in Germany under the auspices of the Society and of the Prussian and Saxon Ministries of Public Instruction. In addition a large number of single lectures and courses of lectures on German literature, music, education, art, history, politics, etc., have been provided in New York City (including Brooklyn), both in German and in English. In 1908 the Society inaugurated a series of publications, which include lectures delivered by Professor John W. Burgess, Columbia, on *Germany and the United States,* and on *The German Emperor and the German Government,* and by Dr. Carl Hauptmann on *Das Geheimnis der Gestalt.* The publication of a quarterly journal devoted to the interests of the Society and to the promotion of the aims mentioned above is contemplated. The first president of the Society was President Nicholas Murray Butler of Columbia University (1905–1907), who was succeeded by Professor John W. Burgess (1907–1909), and Edward D. Adams, Esq. (1909–1911), donor of the Deutsches Haus at Columbia University and Professor William H. Carpenter of Columbia University (1911–). R. T., Jr.

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The Activities of the Germanistic Society of America, 1910. (New York, 1910.)

GERMANY, EDUCATION IN. — GENERAL CHARACTERISTICS. — The German educational system, more than that of any other country, has been formed on the one side through the definite plans of the governing body and on the other through the ideas of philosophic thinkers, and has always remained in a condition of progress and development, although it has often been criticized as torpid. There have appeared in this country neither such absolute centralization nor such sudden transformation as in France. The importance of the German educational system rests mainly on the elementary schools, the gymnasiums, and the universities. But besides these many other types of educational and training institutions have been developed and at present are increasing, while influences from abroad are constantly being felt and followed. Multiplicity of types and a variety of finer distinctions between them are promoted by the existence of the German states side by side, for they are entirely independent in their domestic affairs. It is true that the smaller states have frequently followed the example of the largest federal state, Prussia, but generally this has not been done without considerable departures. Hence an understanding of the German system has by no means been acquired after a glance at the Prussian, and there is as little justification for thinking that a knowledge of the Prussian schools of one particular type has been obtained after observation of one individual instance, — a mistake which is easily made by foreign visitors. Even where the regulations are at bottom similar, individual institutions may show considerable divergence from each other according to the personality of the directors and teachers, or their particular tradition, or the spirit of the locality and its people. At present also the bodies controlling education are explicitly favoring greater independence in the individual schools. The period of greatest uniformity has passed for Germany, while in France this ideal is still maintained to a large extent. The establishment of uniform types of schools is never prompted merely by the desire for control; rather is this based on a belief that the ideal has been discovered and a desire that this ideal should be put into practice everywhere. Owing both to external (economic and other) and internal reasons some hesitation is apparent in relation to the new movement. Foresight and discretion are particularly necessary in the face of the ever increasing clamor which with passionate excitement demands the complete overthrow of the present organization. Further, the feeling that the youth of the nation should not be lightheartedly made the subject of experimentation must meet with approval. Moreover it is an undeniable fact that Germany owes the importance which she has gained in recent times in part to the character of her educational system. Not rigidity, but flexibility; not lighthearted destruction, but thoughtful reorganization; these may be said to characterize the fundamental attitude of educational administration in Germany.

HISTORY. — While a correct appreciation of the educational system of the present is impossible without a knowledge of its history, but the briefest outline will be given here with reference to the titles under which the subjects are discussed. In the Middle Ages education and culture in Germany, as in all other European countries, lay in the hands of the Church; this period is described under Middle Ages and the various topics to which cross reference is there made. This education was accompanied in the case of the upper classes of society by another training for physical and military ability and excellence, and at the height of the medieval period the ideal of chivalric training was introduced from France, an aim which included polite conduct, feeling for the social accomplishments, an understanding of poetry and music. (See CHIVALRIC EDUCATION.) For the people as a whole, that is the lower class of society, beyond the general religious and moral influence, nothing was done. (See, however, the CHARLEMAGNE AND EDUCATION for the period of revival which included the Germans.) For the simplest needs of economic life writing and ciphering were taught in private schools, while on the other side out of a number of the most important ecclesiastical institutions of learning there grew the universities which, however, bore no national character, but reproduced a fairly similar type in France, Italy, Spain, England, and Germany, and in consequence of the universal prevalence of Latin were visited by members of the different nations. (See below GERMAN UNIVERSITIES.)

For the close of the Middle Ages the discussions under SCHOLASTICISM, RENAISSANCE PERIOD, HUMANITIES, CICERONIANISM, and especially the REFORMATION AND EDUCATION relate to Germany. Also the history of Universities (*q.v.*) is closely related to the Teutonic peoples. The development during the Reformation is further discussed under Luther, Melanchthon, Sturm, and other leaders.

An opportunity for the founding of a large number of important schools in the century of the Reformation was afforded by the dissolution of wealthy monasteries by the authorities which had adopted Protestantism. Several of the schools organized at that period attained considerable reputation, educated men of renown, and in a modified form are still in existence; examples are the *Klosterschulen* (see *Cloister Schools*) in Württemberg and the *Fürstenschulen* (*q.v.*) in Saxony. At the same period, too, the ruling princes began to undertake the task of educating their subjects, not as might be thought merely from ideal motives, but with the not unpraiseworthy object of insuring for their countries capable officers, judges, preachers, and teachers. Hence in the course of the sixteenth and seventeenth centuries there were issued in the different states of the Empire well-planned school ordinances; in other words, a definite, universal organization of the school system, including courses of study and instructions on method, took place. Saxony, Brunswick, Württemberg, and Saxe-Gotha deserve special mention here. (See ERNEST THE PIOUS; GOTHA, SCHOOL REFORM IN.) The amount of industry applied by teacher and taught in schools of that period to the attainment of the established humanistic aim, the number of periods, and the extent of the reading, can cause nothing but astonishment. The educational actions in Catholic Germany during this period is also treated under JESUS, SOCIETY OF, EDUCATIONAL WORK OF, and related topics.

In the seventeenth century the eccentric Wolfgang Ratke (*q.v.*) and the broad-minded and keen-sighted J. Amos Comenius (*q.v.*), who proposed entirely new ideas and plans for the aims and methods of instruction, restored the vernacular to its more important place, sought more correct, psychological foundations, made learning easier for the young, and hoped with some assurance to help towards a humanity that would be more valuable. These practical efforts were influential only for a brief period and over a small section of the German schools.

From the humanistic pedantry a departure was made towards the end of the seventeenth century in the direction of versatility and practicality of social requirements by the educational system of the so-called *Ritterakademien*, that is, institutions for the sons of the nobility. (See ACADEMIES, COURTLY.) Here instruction was given in several modern languages as well as a variety of recent sciences and many chivalric and practical accomplishments, generally in a cursory and superficial manner.

The majority of these institutions, however, did not enjoy a long existence. But their aims were partially and gradually adopted in the other institutions for higher education, while even the educational organizations of the Pietists (*q.v.*) (*c.* 1700), especially the school system established at Halle by A. H. Francke (*q.v.*), now included a variety of *real* knowledge, offered an opportunity for learning different types of manual and industrial occupations, introduced easier methods to facilitate the learning of Latin, made room for exercises in the vernacular, and, as is to be expected, made religious and moral education the main object. From this point *Real* schools were developed since about the middle of the eighteenth century, the earliest of which in a modified and improved form still continues to exist in Berlin. (See HECKER.) The pedagogy of the Pietists equally promoted opinion in favor of the right of the lower classes to education.

After compulsory school attendance had already been introduced in the seventeenth century in some of the small Thuringian states, as, *e.g.* in Saxe-Gotha, such compulsion was definitely imposed from 1713 in the rising state of Prussia by the energetic, yet reckless king, Frederick William I. Under his greater successor, Frederick the Great (*q.v.*), the elementary school made hardly any progress. There was a feeling for a long time that duties of an elementary school teacher should be intrusted to anybody of the most modest personal education, such as artisans, or noncommissioned military officers; while instruction was limited to the elements of reading, writing, and arithmetic and questions on the Catechism. The view that religious knowledge or even only verbal formulæ are a guarantee for Christian feeling and God-fearing conduct was only gradually superseded, or perhaps has not yet altogether disappeared. The first actual normal school was established towards the end of the reign of Frederick the Great at Halberstadt in 1778, and that through the efforts of a private person, the noble philanthropist and friend of youth, Eberhard von Rochow (*q.v.*), who found a supporter of his principles in the Minister of State, Freiherr von Zedlitz (*q.v.*), whose highly meritorious activity was devoted to the perfection, internally and externally, of the whole public educational system. Both men were influenced by the new spirit of Philanthropinism (*q.v.*) which in its turn had partly been aroused by Rousseau (*q.v.*), but in several points had deviated widely from his views. With a new view of the aims and means of education not only the founder of the movement, J. B. Basedow (*q.v.*), established an institution at Dessau, styled the *Philanthropinum* (1774), but a number of similar institutions followed, and there was no lack of active followers. (See CAMPE, SALZMANN, etc.). With Rousseau they shared the belief in the original goodness of human nature; they desired to subordinate the importance of instruction to that of an education for other valuable qualities, recognized the natural rights of youth, and hoped to dispense almost entirely with pressure, compulsion, and punishments. In the spirit of the time they saw in happiness the true end of all human education. Quite in opposition to Rousseau, however, they always thought of the ability of their pupils in reference to the enlarged society, and social usefulness was to be combined with happiness. Throughout they also stood for authority and obedience. But while they turned all learning to play, swept away all real difficulties from before their pupils, were satisfied with all kinds of superficial knowledge, were willing to stimulate by a system of external rewards, they in no way promoted true character-formation, and called out the strongest opposition, while their institutions only attained a slight importance. It must at once be said, however, that several of their principles have recently again come to the front and receive wide recognition.

The most determined opponents of the Philanthropinists were the representatives of the New Humanism, who then won a decisive influence over the organization of higher education, which continued for a long time. (See NEO-HUMANISM.) The earliest leaders in this movement, including, from about 1730 on, J. M. Gesner, Ernesti, Heyne (*qq.v.*), also had their broad pedagogic convictions and desired to win over the student body by beauty of content in the subject-matter, that is, essentially the classical antiquities. From this time on, it remained the program of the new humanistic educators to inspire enthusiasm for the language, literature, thought, and character of antiquity, and to promote the moral development of their pupils by the study of a nobler human type. In this attitude the great poets, as for example, Herder (*q.v.*), were either in agreement with or even anticipated the philologians, as Fr. August Wolf or Friedr. Thiersch. Influential statesmen, too, adopted the same views, and a particular instance is William von Humboldt (*q.v.*), who about 1810 directed the Prussian educational system, and together with several important councillors exercised the decisive influence in the organization of the gymnasiums. And yet the philologically trained teachers, to whom instruction in the classics was intrusted, failed in the subsequent period to arouse that expected enthusiasm, since they restricted their pupils too much to the linguistic difficulties. Nor could the view that the ancients presented the highest type of humanity be maintained according to the modern conception of Greek and Roman antiquity.

Equally significant was the influence exercised on lower education in Germany at about this time (1800) by the great-hearted Swiss, Pestalozzi (*q.v.*). His efforts, although applied only in small private undertakings, were very soon recognized and fully appreciated by representatives of the Prussian state and were adopted as the standard for the internal organization of their elementary schools. With this there began not only a new and better period for these schools, not only were their services increasingly valuable, not only did the new and idealistic class of elementary school teachers arise in the one state, but this state, Prussia, where at the same time that new class of high school teachers had arisen, acquired a position as leader and guide of Germany, while Germany itself in the subsequent period stood out as the country of the most intensive pedagogical interests and the most consistent educational organization. Many differences remained in the last few centuries between North and South, and particularly between Protestant and Catholic territories, but in the educational sphere there gradually appeared a satisfactory assimilation. The Roman Catholic Church, indeed, has never ceased to claim all school education for herself and her ministers, and the German governments have never ceased to admit to the Christian churches a right to share within well-defined limits in the supervision of the schools and to utilize the assistance of their representatives. But on the whole the schools have more and more become a matter for the state alone, even in cases where the maintenance and direct support were undertaken by individual communities.

The external organization of the lower as well as the higher schools (the latter being styled in South Germany "middle schools" with reference to the Universities which are the real "high schools") continued in the course of the nineteenth century to be carried on predominantly on the plan that typical forms must so far as possible be made universally binding, with the result that flexibility in the individual schools, teachers, and even pupils was temporarily checked. It is noticeable, however, how this whole tendency is gradually giving place since the last century to another which is opposed to it. The number of educators who took part in perfecting the system has always been great at this period and the investigation for better methods has scarcely ceased for a single moment. The strongest impulse in this direction was afforded by Herbart's (*q.v.*) pedagogy (first published in 1806), even though his psychological principles have been shattered since then and their too mechanical formulation, which was the work of his disciples, especially Ziller (*q.v.*), is at present being attacked or rejected on all sides. But the careful research into the teaching and learning processes which since that time is being pursued with still greater psychological thoroughness is the undoubted contribution of this great educator.

So far as the further development of the external organization is concerned the elementary schools with universal compulsory attendance have not only been increased from decade to decade, but have been more carefully articulated into classes, the hitherto poor material conditions of the teachers have been improved, the training of teachers in numerous normal schools and the preparatory institutions preceding them have been perfected, and a large variety of schools for pupils deficient in some personal equipment have been erected. New cultural subjects have been added to the simple, traditional elements in the curriculum of the ordinary elementary schools, and in recent years the care for the further education of pupils from the age of fourteen, the leaving age for the elementary school, up to sixteen or eighteen, is a matter of considerable discussion and experimentation. Attendance at continuation schools has already been made compulsory in many places, since intellectual and moral neglect, particularly at this age, is fraught with much danger to national life.

For higher education it was particularly significant that the transition from the gymnasium, which had gradually increased to nine classes, to the university was since the end of the eighteenth century (1788 in Prussia) made dependent on an exacting leaving examination (*Maturitätsprüfung*) and has so remained. Further, there was introduced a difficult examination *pro facultate docendi* (1810 in Prussia) which called into existence a well-defined and trustworthy profession of high school teachers. For the supervision of the teachers and administration of school affairs the government bodies established their own, purely state authorities, as for example the *Ober-Schul-Kollegium*, since 1825 *Provinzial-Schul-Kollegien* (Provincial School Boards) with a comparative amount of independence under the Minister of Instruction. Lastly, certain state privileges, especially the right to one-year service in the army (*einjähriger Militärdienst*), were attached to attendance at certain types of the higher schools. That this last provision contributed largely to uplift general education in the nation is undeniable. It embodies, moreover, a democratic principle, since no distinction of rank or wealth is considered in connection with that privilege, which may be attained by any person through individual merit.

The curriculum, the selection of subjects, the amount of time to be devoted to each in each grade, the regulation for the decisive examinations, have all naturally been frequently revised and altered in the course of time, as changes in the sciences, cultural life, and needs of the time demanded. The last regulation of the courses of study in Prussia dates from 1901. The other German states approximate Prussia in their organization. A controversy extending over several decades centered round the relation of the *Real* schools (that is, schools with a modern curriculum, modern languages, natural sciences, etc.) to the schools which had their origin in the humanistic period, the gymnasiums; although these have in the course of time adopted subjects of more modern content, they are particularly marked by their serious study of Greek as well as Latin, having recently dropped the early rhetorical-stylistic aim of the study of Latin. *Real* institutions, with an equally long curriculum of nine years, were first recognized in Prussia as *Realschulen I. Ordnung*, or *Realgymnasien*. Since 1901 the *Gymnasium*, the *Realgymnasium*, and the *Oberrealschule*, with a Latinless nine-year course, receive fundamentally the same recognition. All these types of schools are regarded as general educational institutions rather than as preparatory schools for any special professional course, and the ever-increasing simpler *Realschulen*, with a six-year course for pupils between nine and fifteen, show the same tendency. It is especially difficult for Germans to think of any educational ideal that is not general and valuable in itself. The utilitarian standpoint meets with only slight recognition anywhere. Hence the formal side of education is regarded as more important than the material equipment for life, while linguistic and grammatical instruction has ceased to be regarded as the sole means for developing the powers of the pupils.

All the higher schools in common pursue with the same objects the study of German (linguistic and literary) and history, while religious instruction is everywhere obligatory. It is demanded in certain quarters that the last should be left to the religious corporations, but the feeling neither of the authorities nor of the teachers is favorable to such a view.

The multiplicity of institutions for instruction and education has increased rapidly in the last decade. The increasingly popular *Reform Schools*, with the postponement of Latin by several years, are only one type. Although coeducation of boys and girls has up to the present not been introduced in most German states, the question of an equal and comprehensive education of the female youth has been seriously discussed and curricula and courses of study have recently been prepared to meet the situation, so that this side of national education seems to have a brilliant future. Another entirely recent tendency is the reëstablishment of boarding schools (*Internate, Alumnate*) to be connected with the higher schools, or at least to adopt their curricula and to bear a different character from the earlier boarding schools of an institutional character or the French *lycées*. Most of these institutions up to the present are private undertakings. But all private establishments for education and instruction are under state supervision. The idea of national education must outweigh that of individual education. Individual powers must be developed, but at the same time altogether in the interests of the nation as a whole.

And nationalism no longer means the obstinate and unquestioning acceptance of traditional peculiarities. Attention is in recent years being frequently directed to foreign countries and the good points in England and America in particular are studied with a view to some extent to their adoption. Thus some experiments have been made in self-government of pupils. A wider power of election is to be permitted to students, at any rate in the upper classes of the higher schools. By the side of gymnastics, which have long ago found a home in Germany, athletics and manual instruction have been increasing. But caution and discretion in the recognition and adoption of new ideas remains the principle with educational authorities in Germany. Hence they have rarely been compelled to retrace their steps.

There has been no lack of alternation between more liberal and more conservative points of view in the last century. At times some very reactionary measures were in force, as in 1850, for the training of elementary school teachers; while at the present moment from the socialistic standpoint very revolutionary demands are being made. Hence the proposal for a uniform school (*Einheitsschule*), with one and the same foundation equally obligatory on all children of the nation, and the free access to all educational institutions for the able, — demands against which strong reasons have been brought. On the other side an attack is made on class instruction which favors only the mediocre, and special schools are now and then demanded for the specially gifted in order to create a national *élite*.

To hold that the German system is at a standstill, or to form the idea of a rigid organism from isolated impressions or exaggerated judgments, it must again be emphasized, would be particularly unjustifiable. It is merely that the present advance is less noisy than elsewhere. The protests against present conditions, which at the moment are raised excitedly in certain quarters and especially in the daily press, are going too far. With unfounded optimism there is talk of the value of unchecked, unregulated development of the immature person, while the effect of the present system is regarded with unjustified pessimism. Confidence in these schools, whose value was previously accepted without question, has disappeared because families were too long kept at a distance from them, and the establishment of confidential relations between teachers, parents, and scholars forms one of the greatest tasks of the future. On the other hand criticism is frequently due to the subjective instability and nervous discontent of educated people of to-day, and serious charges are brought against present education in the family. But each individual thinks that he ought to judge of the scope of education on a basis of disposition, casual experience, and ideas of the moment.

It must, however, be recognized that the task of the future is to provide for the introduction of the field of educational science more generally in the highest educational institutions, the training grounds for the most intensive thinking. (See EDUCATION, STUDY OF.) At the same time it is regarded as an equally important need of the educational system to place a professional expert at the head of the whole department which up to the present has been under a Minister merely as one section of his work. But that desires are unfulfilled and that important demands for the future remain, is not a sign of an actual standstill. The great problem of education is always unending and ever gives rise to new questions. That the highest object must under all circumstances be the training of the will is self-evident. But by which system this can best be attained may be left as a subject of competition between the nations. W. M.

PRESENT SYSTEM. — As in America, the control of education is constitutionally in the hands of the individual states and is almost entirely removed from the imperial or federal government. The Imperial Chancellor, as representative of the Empire, has only the right of defining the qualifications for the privilege of the one-year service in the army and to bestow to individual schools the right of granting such certificates. For this purpose he is supported by the Imperial School Commission, consisting of about seven members as representatives of different states, and holding a short business meeting usually once a year. Its functions are inconsiderable. The Cadet Corps, which always include a higher school, are under the control of the Emperor as supreme head in military affairs. Thus there is no uniform and unifying imperial authority in German school affairs, and the German educational system is far more varied than appears to a foreigner on a brief visit. The extent of this diversity cannot be wholly presented in this account, which will be devoted primarily to a survey in outline of the school system of the largest federal state, Prussia, and only incidentally to that of other states. Further, Germany does not possess a bureau of information such as the United States Bureau of Education, and it is difficult or even impossible to afford a complete description of the present situation.

While in America there is an educational ladder leading directly from the primary school to the university, no German state has a uniform school system in this sense. On the contrary, two systems must be constantly distinguished, the lower or elementary school system and the higher school system. A transference from one to the other is only possible at one point, viz. after the third or fourth school year. All other types of schools or curricula are connected more or less closely with these two.

Legislative Principles. — As will have been noticed above an imperial educational code does not exist, although the Imperial Law on Child Labor in industrial occupations, March 30, 1903, refers indirectly to education. In addition there are agreements between the federal states for the mutual recognition of examinations, particularly the *Abiturientenexamen* (*q.v.*) for entrance to the universities. These agreements, which have been entered into by a majority of the states, have at any rate in higher education as unifying an effect as imperial laws, much in the same way as the College Entrance Requirements Board in America.

In the individual states education is regulated either through a comprehensive education code (*Schulgesetz*), as in Saxony and Württemberg, in which case the lower and higher systems are generally treated in separate laws and occasionally only one system is dealt with uniformly; or the most important sections are embodied in special laws while the rest is supplemented by the government through ordinances, as particularly in Prussia. But with the rapid and progressive development of Germany, even where uniform educational laws exist, special laws and various ordinances are necessary to adapt the school system to the changing conditions. Elementary education is based on laws more than higher education, which more frequently, and especially in Prussia, is regulated by ordinances. The following questions are the subjects of legislative enactment in almost all the states; the training, appointment, and conditions of service of the teachers, their pay, pensions, and provision for their dependents, the maintenance of schools, school inspection and attendance, as well as the denominational organization of schools.

Prussia has no school code. The legislative foundations of her school system, apart from a few earlier regulations for individual sections of the kingdom, are contained in Articles 20–25 of the Constitution of January 31, 1850, which run as follows: —

> (20) Knowledge and its dissemination are free. (21) Satisfactory provision for the education of youth shall be made through public schools. Parents and their representatives must not allow their children or wards to be without such instruction as is prescribed for the public elementary schools. (22) Every one is free to give instruction and establish educational institutions, provided he has proved his moral, intellectual and professional fitness to the proper state authorities. (23) All public and private educational institutions are subject to the inspection of authorities appointed by the state. Public teachers have the rights and duties of civil servants. (24) In the organization of public elementary schools denominational conditions must be considered so far as possible. Religious instruction in the elementary schools is under the direction of the religious corporations concerned. The management of the external affairs of the public schools is in the hands of the community. The state with the legally regulated participation of the communities appoints teachers from a list of suitable candidates. (25) Funds for the erection, maintenance, and extension of public schools are raised by the communities, and where inability to do so is proved the state may give supplementary aid. The duties of third parties based on special titles remain as before. The state guarantees the teachers a fixed income according to local circumstances. Instruction in public elementary schools is free.

In addition the *Law for the Maintenance of Public Elementary Schools of July* 28, 1906, which includes far more than the title implies, is of importance. Its contents are as follows: (1) Maintenance of schools. (2) Distribution of the cost of elementary schools; maintenance of the schoolhouse; building fund; state support. (3) School property; aid from other sources. (4) Denominational conditions. (5) Administration of elementary school affairs and appointment of teachers. (For the foreign observer sections (4) and (5) are particularly noteworthy.)

Higher education in Prussia is regulated by ordinances or decrees of the Minister or through the supreme decree of the King, while Saxony, for example, has a law also for higher education. (See Lexis, Vol. III, p. 65; Von Bremen; Morsch.)

Administration of Education. — *Central Authorities.* — The supreme direction of the internal organization of the schools is in all the states in the hands of state authorities; in Prussia this is provided by Article 23 of the Constitution mentioned above. This power no longer rests as previously with the church, nor, as is general in America, with the local communities. In no state has there yet been developed a central authority whose only concern is school matters. Generally public worship, occasionally a still wider sphere of duties, as, for example, justice in Baden, are under the charge of the same minister; sometimes, as in Hesse, education falls to the share of the Minister of the Interior; a simpler organization is, of course, possible in the smaller states (Hesse has a little over one million population).

The highest authority in Prussia is the Ministry for Public Worship and Education; in Bavaria the Ministry of the Interior for Public Worship and Education; in Württemberg the Department for Ecclesiastical and School Affairs. When the Prussian ministry became independent in 1817, it was still quite possible to supervise the whole field assigned to it. This is no longer possible at present, and since 1911 the Department for Public Health has become a separate body, while the demand for a separate Ministry for Education is constantly becoming stronger. At the head of this office stands the Minister, usually called *Kultusminister*, who is supported by the Under-Secretary as his deputy. The ministry is divided into three departments: (1) Department for ecclesiastical affairs. (2) First department for education (higher and girls' schools). (3) Second department for education (elementary schools). A ministerial director stands at the head of each department. Further there are attached to the office from thirty to thirty-five special councillors and from ten to fifteen assistants. The majority of these officials so far, always including the Minister himself, are jurists or administrative officials. The organization in the other states is much simpler. In several of these, as in Bavaria and Baden, almost all the councillors are jurists. In addition to the routine administrative duties various conferences take place in the ministry, at which questions are determined not by majority vote, but by the decision of the presiding official. Responsibility, however, is formally borne by the Minister, to whose notice important matters are accordingly brought for his personal decision. Since the Minister cannot supervise the details of his wide field, and frequently has not the necessary acquaintance with persons or the professional knowledge, an extraordinarily wide influence is often exercised by the experienced directors, although the scope of their duties is entirely dependent on the will of the Minister. As an instance may be mentioned the late Fr. Althoff (*q.v.*). Where wider changes are contemplated, the Minister summons a consultative conference to which leaders in all walks of life are invited. Such conferences, for example, took place in 1907 on the reform of the education of girls, as well as in 1890 and 1900 on the reform of higher education.

Intermediate Authorities. — In the larger German states there are between the central board and the individual schools state intermediate boards, which, although differing everywhere in composition and functions, always have the constitution of boards. Examples of these are in Bavaria the Supreme School Council (*Oberste Schulrat*), in Württemberg the Superior School Council (*Oberschulrat*), in Prussia the Provincial School Boards (*Provinzial-Schulkollegium*). As a rule the members are not elected, but appointed by the central authority, and number variously from five to ten or more. The composition of these boards shows great variety: in Bavaria the board includes two university professors, two professors of technical high schools, five directors of classical gymnasiums, two directors of realgymnasiums, a rector of a real-school, one superior medical councillor. Baden shows a similar constitution. In the free town of Hamburg, which in other ways also possesses a very peculiar school organization, there are lay representatives on this board as well as on the communal education committees. But in Hesse and, particularly, in Prussia, neither university professors nor laymen nor practical schoolmen sit on this board, although a number of members have been in the teaching profession. The sphere of duties of these authorities is as varied as their composition. In Bavaria the Superior School Council has only the management of the internal affairs of the higher schools, while everything of an external character comes under the control of the county administration. In Württemberg only the higher schools are under the intermediate board, while elementary education is administered by the ecclesiastical authorities. In Baden the Superior School Council has charge of both higher and elementary education, including the administration of external as well as internal affairs. In these states the intermediate authorities are in intimate relations with the ministry, and with the exception of Bavaria a number of the members belong to both boards. Decisions are reached in Baden and Württemberg by resolution of the intermediate authority, but are subject to the decision of the Minister.

The intermediate authorities in Prussia are organized on a different plan. They are entirely separated from the central board, and between individual institutions and the central authority, the Minister, there are no direct business relations. On the whole, their organization follows that for the administration of internal affairs. The Prussian monarchy is divided into twelve provinces, each under a president. Each province is subdivided into from two to six counties under a county president; the office which administers these districts is known as the County Government (*Regierung*). The county is further divided into town communities, under a mayor, and districts under a chairman (*Landrat*); these districts are again made up of rural communities under an overseer, and estates also under a similar official. The duties of intermediate authorities for lower or public elementary education are undertaken by authorities for internal administration, that is, the County Government (*Regierung*), a department of which is devoted to ecclesiastical and educational affairs. The County Government has the supervision of all school activities, while external administration falls to the share of the community authorities with the approval and confirmation of the county government. The officials of the County Government for the inspection of elementary schools are the District School Inspectors (*Kreisschulinspektoren*), the majority of whom up to the present are clerics primarily and exercise their inspectorial duties incidentally, although the number of definitely professional inspectors is gradually increasing, especially in the towns. Under the District School Inspector stands the Local School Inspector (*Ortsschulinspektor*), an office usually exercised by the pastor or priest of the place, or by the principal for his own school. The principal is the director of the individual schools, in so far as they consist of several classes, and under him are the teachers.

The intermediate authorities in Prussia for higher education, including also normal schools and preparatory training institutions, and, in Berlin only, the elementary schools, are the Provincial School Boards already mentioned, of which there are twelve, one for each province. They are presided over by the Chief President of the respective provinces, who is assisted by a varying number of councillors who have been in the teaching profession. These officials exercise the inspection of higher schools, which are occasionally visited also by ministerial councillors. On the whole, however, the supervision of higher schools is of little value, and inspections take place comparatively rarely, with the result that each school enjoys a great deal of freedom. The duties of the Provincial School Boards are described as follows by Morsch (p. 343), and include: —

> (1) All matters bearing on the educational aim of the institutions; (2) the examination of organizations and statutes of schools and educational institutions; (3) the examination of new and the revision and confirmation of already existing ordinances and regulations no less than the provision of suitable recommendations for the removal of abuses and defects which have crept into any educational or school system; (4) examination of school textbooks in use; the decision as to which are to be dispensed with or introduced with the previous approval of the superior ministry; (5) examination of new textbooks. . . ; (6) another and more influential means of school inspection is the *Abiturienten-Examen*, at which a commissioner from the Provincial School Board is generally present; (7) the appointment of commissioners to hold the *Abiturienten-Examen*, and inquiry into the transactions of the examination commission in the schools; (8) the supervision, direction, and inspection of schools which lead to the universities; (9) the appointment, promotion, discipline, suspension, and dismissal of teachers in these institutions.

Further to these boards is assigned the supervision of all the external administration, the finances and budget, which in schools maintained by communities are administered locally. Each higher school is administered by a Director, who is assisted by the *Oberlehrer*. The private higher schools, of which there are only a few, are subject to state supervision equally with the public schools.

All these above-mentioned authorities are state officials. In addition there are local or communal bodies, parts of the local administration of communities. Here the multiplicity of deputations, commissions, governing boards, councils, committees, etc., is so great, and their constitution so diversified and frequently so complicated, that any attempt to describe them would be futile, even if the material were available. In general it may be said that only the external administration is the business of the community, such as the erection, equipment, and superintendence of buildings, the sanitary arrangements, financial management, rarely the questions of discipline in the schools, although all these activities are always subject to the approval of the superior state boards. The most important right of the Prussian community is the selection and nomination of the whole teaching body; but here, too, the appointment of every teacher must be confirmed by the state. Towns with larger systems appoint a school superintendent as a professional adviser. This office will increase in importance with the rapid growth of German towns, and the significance which such a position can attain in the hands of an energetic man is shown by the example of Kerschensteiner in Munich. The local bodies do not have the rights of supervisors over teachers and school directors. The higher institutions of learning maintained by the state, of which there are quite a number, are naturally not subject to local control.

Teachers and Conditions of Service. — Teachers, whether male or female, whether in state or communal schools, have in Germany the position and character of civil servants, whose rights and duties are definitely laid down by general service regulations. Accordingly, they receive their appointments only on the basis of the state-regulated preparation, of which evidence must be given by a state examination (towns have not the right to hold examinations); they have a definite career, definite titles which express their duties or position within the official organism; their position is for life and not terminable by notice; they receive a definite, annually increasing salary; they are entitled by law to a definite pension and to provision for their dependents on their death. The titles and career of teachers in Prussian elementary schools are as follows: immediately on their appointment they are called Teachers; if they have charge of a small school of one or two grades, Principal Teachers; on appointment after the appropriate examination to the direction of a larger elementary school, they are called *Rektor;* finally they can become District School Inspectors. Up to the present female teachers do not advance to higher positions. In the higher schools after the state examination during the period of preparation the title is Candidate for Higher School Appointment; between the period of preparation and appointment they are known as assistant teachers (*Wissenschaftlicher Hilfslehrer*); in the nineties this period was quite long, often up to ten years, but in recent years appointment has followed immediately after the preparatory period as a general rule; after appointment they are called Teachers (*Oberlehrer*), of whom the older members receive the title of Professor, which, however, does not carry with it any other duty or a higher salary. The teacher may rise to the principalship of a higher school with the title of Director. Further they can become Provincial School Councillors, or Special Councillors in the Ministry. A change of career, which is so frequent among teachers in America, is very rare in Germany. This is due to the many rights which the official has and acquires, as well as to the exclusive and specialized preparation for every profession.

Every official may resign his position, but surrenders all the rights which go with it. No official may be given notice, dismissed, or retired on a pension except after a disciplinary inquiry. Disciplinary courts of first instance are the direct superior authorities for officials of the middle class, including the *Oberlehrer*, while for the higher officials, including directors, there is a special court in Berlin; neither of these are the ordinary courts. When proceedings are brought against an official merely for a breach of duty, in so far as it does not trespass the penal code and is only subject to the superior authorities, the case is withdrawn from the ordinary courts.

The income of officials consists usually of several items. The fixed minimum and the increments make up the salary proper; to these must be added the compensation for rent, which varies with the cost of living in different places, and occasionally local additions. The officials move up automatically on the salary scale according to years of service. The salary of elementary school teachers is given in the following table (4.20 M. = 1 dollar): —

INCREMENTS AFTER YEARS OF SERVICE

After	7	10	13	16	19	22	25	28	31
					years of service				
Minimum Salary 1400 M.	200	200	250	250	200	200	200	200	200
Total salary	1600	1800	2050	2300	2500	2700	2900	3100	3300

The compensation for rent, which is additional, amounts to from 200 to 800 M., and the local additions, in towns of over 10,000 population, up to 900 M., so that the highest possible income is 5000 M. Female teachers receive a somewhat lower, middle school teachers a somewhat higher salary. The salary of principals consists of the same minimum as that of teachers, *i. e.* 1400 M., to which is added from 500 to 1000 M. more in virtue of his position (*Amtszulage*), and a compensation for rent which is more by 25 per cent than that of teachers, viz. 250–1000 M. And finally the salaries of District School Inspectors amount to from 3000 to 7200 M., which may be reached in six stages of 700 M. each. The compensation for rent is from 560 to 1200 M. The compensation for rent varies with the cost of living in different towns. In Prussia the localities are by law divided into five classes (A to E). To class E belong those places where the cost of living is lowest, so that the rent indemnity is lowest there. Class A stands at the opposite extreme. The rent indemnity is thus a means which, keeping the minimum salary everywhere at the same level, seeks to adapt the total amount of income to local circumstances.

The salary of teachers in higher schools (*Oberlehrer*) is indicated in the following table:

Salary: initial	after 3	6	9	12	15	21
			years of service			
2700 M.	3400	4100	4800	5400	6000	7200

To this from 560 to 1300 M. must be added as compensation for rent. The salary of female teachers is somewhat lower. The directors in complete institutions receive: —

Salary: initial	After 3	6	years of service.
6600 M.	7200	7800	

The rent indemnity amounts to from 900 to 1800 M. The salary of Provincial School Councillors is 6300 M., rising in three stages to 8000 M., with a rent indemnity of from 900 to 1800 M. The Special Councillors in the Ministry receive 7000 M., rising in three stages to 11,500 M. after twelve years of service. The rent indemnity is 2100 M.

Pensioning of teachers is dealt with by the Prussian Pension Law, Section 1: "Every civil servant who draws his salary from the state receives from the same a pension for life when he is incapacitated for the performance of his duties after at least ten years of service in consequence of physical disability or other infirmity or intellectual failing, on account of which he is retired. Where the incapacity is due to illness, wound, or other accident, with which the official has met in the exercise of his duties or through contributory cause with no fault of his own, the right to a pension becomes due even before the completion of ten years of service."

Section 7. "Where an official is incapacitated before the completion of ten years of service and is on that account superannuated, except under circumstances referred to in the second half of the first paragraph, in case of destitution a pension for a definite period or for life may be granted with the approval of the King."

When an official is sixty-five years old the claim for a pension is not conditional on incapacity. The amount of the pension is determined as follows: "Where the retirement takes place after the tenth, but before the completion of the eleventh, year of service, the pension amounts to $\frac{20}{60}$ and rises with each completed year up to the thirtieth year of service by $\frac{1}{60}$ and thereafter by $\frac{1}{120}$ of the income. But there is no increase beyond $\frac{40}{60}$ of this income." In calculating the pension the whole income last received inclusive of the rent indemnity is used as a basis; local additions are as a rule subject to pensions. In 1906 there were in Prussia alone 10,025 teachers from elementary schools in receipt of pensions, of whom 8381 were male, and 1644 female. The total amount of pensions was 15,007,764 M. (13,562,980 M. for male, 1,444,784 M. for female, teachers); the average pension for males was 1618 M. and for female teachers 879 M. Widows and children of deceased officials have also a claim to a pension, in the calculation of which the following provisions are made in Prussia. "The amount received by the widow is 40 per cent of the pension to which the deceased would have been entitled, if he had been superannuated at the time of his death. The sum for widows must not be less than 300 M. nor more than 3500 M. The allowance for orphans is: (1) For children, whose mother is living and at the time of the death of the official was entitled to the widow's allowance, a fifth of that allowance for each child. (2) For children whose mother is no longer alive or at the death of the official was not entitled to the widow's allowance, a third of that allowance for each child. The allowance for widows and orphans must not exceed the amount of the pension to which the deceased was entitled or would have been entitled if he had been superannuated at the time of his death."

The conditions treated in the foregoing account are as a whole similar in the rest of the federal states, although differing in details in many ways, which cannot be entered upon here. It may be mentioned, however, that occasionally teachers, as other officers, have to contribute to pension funds, in which case the maximum pension is usually higher, as in Bavaria.

Arising out of the fixed and definite position already described and the high professional efficiency due to the thorough preparation, the social standing of teachers in elementary and higher schools is high. For the same reasons these teachers have developed a strong professional feeling, even though it is at present confined to each grade respectively. Just as there is no bridge leading from the ranks of elementary school teachers to higher school teachers, so both regard themselves as separate professions, and the professional organizations of both work entirely independently of each other; but since higher and lower education are separate systems, each with different problems, this separation is not such an evil.

TABLE I

	1901	1891	1881
Number of men in the army	260,416	182,827	150,130
Without schooling	131	824	2,332
Per cent of whole number	0.05	0.45	1.55

TABLE II

	1891	1901
School population	4,464,906	6,103,745
of whom there were:		
1. In public elementary schools	3,900,655	5,670,870
Per cent	87.36	92.91
2. In other schools	222,211	339,017
Per cent	4.98	5.55
3. Temporarily excused from attendance, but duly registered	312,219	82,638
Per cent	6.99	1.35
4. Not registered on account of physical defects	9,038	10,672
Per cent	0.20	0.18
5. Illegally kept away from school	20,783	548
Per cent	0.47	0.01

(Based on Lexis' *Public Education in the German Empire*, p. 96.)

Attendance. — In all German states compulsory school attendance prevails, lasting generally eight years (seven in Württemberg), and beginning with the sixth year. In Bavaria there is compulsory attendance at Sunday school from fourteen to seventeen. The extension of school compulsion to the continuation school (*q.v.*), that is, beyond the fourteenth year to the eighteenth, or up to entrance into the army (which is in itself a powerful educational institution), has not yet been introduced everywhere, but is earnestly striven for. Much remains to be done in this field, particularly for girls. Legal compulsory attendance is everywhere strictly enforced in Germany, and in the last resort is secured with the aid of the police and the courts. Only on proof that children are receiving satisfactory instruction privately is exemption from school granted. Hence the percentage of illiterates in Germany is almost nil, as may be seen from the tables on page 71.

School and Church. — The opposition between the Protestant and Catholic denominations (Germany is about one third Catholic and two thirds Protestant) has been one of the greatest influences in German history, and is still one of the most important factors in domestic politics. No wonder then that this is reflected in education. The public higher schools are almost wholly interdenominational or undenominational (*simultan*); the lower schools are undenominational in only a few states, as in Baden and Hesse, while the denominational elementary schools exist in the largest states, especially Prussia. The most important legislative enactments on this question read as follows: " Public elementary schools are to be so organized that Protestant children receive their instruction from Protestant teachers, Catholic children from Catholic teachers." " In public schools with several teachers, either only Protestant or only Catholic teachers are to be appointed." Finally, " when in any school community, which has only elementary schools staffed with Catholic teachers, the number of local Protestant children of school age for five consecutive years is over 60, or in towns and rural communities of more than 5000 inhabitants, over 120, then, provided that the legal representatives of more than 60, or more than 120 children of school age of the class mentioned, make recommendations to the supervising educational authorities, instruction is to be arranged in schools wholly under Protestant teachers," and vice versa. Jewish pupils are received into the elementary schools; where a Jewish community is large enough, it may erect a separate school, although their number is in any case very few. In 1906 the percentage of children who were in schools of their own denomination was as follows: —

	IN TOWNS	IN THE COUNTRY
	Per cent	Per cent
Protestant	92.20	97.27
Catholic	87.25	91.47
Jewish	30.03	20.37

Coeducation. — For boys and girls in higher education separate institutions are provided almost everywhere, only a few South German states (Baden, Hesse, Württemberg) admitting girls into the boys' schools; up to the present this has not been done in Prussia. In the elementary system special girls' schools or girls' classes are provided when the numbers are large enough. In 1906, 65 per cent of the elementary school classes in Prussia were mixed, containing 64 per cent of all the children. There were 40,376 separate classes and 75,526 mixed classes. In the towns, of all the children 1,669,286 were in separate classes and 636,979 in mixed; in the country, 561,537 were in separate and 3,296,596 in mixed classes. Thus in the towns separate classes, and in the countries mixed classes predominate.

Cost of Education. — The maintenance of elementary schools as a general rule falls by law on the communities; the state enters only in case of need and gives assistance only to smaller communities. The terms of the Prussian law on the subject are: " The erection and maintenance of public elementary schools falls, with the exception of the provisions of this law, . . . on the municipal communities and the independent districts. Communities (or districts) either are independent school districts or may be united for the maintenance of one or more schools into one common school district (*Gesamtschulverband*). One community may belong to several union school districts. Even when it forms one independent school district, it may belong at the same time to one or more union districts" (Section 1). According to Section 7, " Where the inability of a school district to raise the cost of maintaining an elementary school is proved, subsidies are given by the state. Further the state grants to smaller communities a part of the cost for new school buildings." The amount of expenditures for the purposes of elementary education is indicated in the following tables (from *Statistisches Jahrbuch f. d. deutsche Reich*, Vol. XXIX (1908), p. 153): —

EXPENDITURE FOR PUBLIC ELEMENTARY SCHOOLS
(1 Dollar — 4.20 Marks)

States	Total		Amount contributed by the State (in 1000 Marks)		Cost per Pupil in Marks	
	1901	1906	1901	1906	1901	1906
Prussia . . .	269,917	328,247	73,066	82,378	48	53
Bavaria . .	39,766	52,680	14,206	18,937	46	55
Saxony . . .	36,548	45,364	6,998	10,391	53	59
Württemberg .	12,265	15,809	3,748	5,333	42	50
Baden . . .	10,999	16,033	2,396	4,472	40	52
Hesse . . .	7,875	10,170	2,506	2,888	48	54
Alsace-Lorraine	8,869	10,677	2,630	3,050	39	44
German Empire	421,317	522,861	122,898	150,134	47	54

Sum total of state expenditures of Prussia[1] (the expenses of the communities not included) for public elementary instruction, training of elementary school teachers, etc.

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[1] Figures taken from *Etat des Ministeriums der geistl.*, etc. *Angelegenheiten*, 1910.

	Marks
I. Current expenses	
Normal schools	11,106,232
Preparatory institutions	2,247,673
For both groups to be added	757,539
Normal school for gymnastics	333,880
School supervision	4,422,420
Elementary schools	141,417,317
School for defectives	304,632
Sum total of current expenses	161,586,776
II. Single expenditures for elementary schools .	6,265,440
To the communities for education of negligent dependent and delinquent children . . .	6,000,000
Instruction in prisons and jails	203,500
Sum total of single expenditures	12,468,940

Expenditure of State and Communities for Public Elementary Schools in the Cities and in the Country in Prussia (in Marks)

	Cities		Country	
	1896	1906	1896	1906
1. Total (including building expenses)	83,129,558	163,252,542	102,787,937	153,956,514
Of this sum:				
Salaries	60,545,580	111,208,768	73,367,542	107,670,644
Equipment	22,583,978	52,043,774	29,420,395	46,285,870
2. Total contributed				
By the state	13,327,759	16,175,140	39,610,836	53,095,034
By the communities, etc. .	67,426,515	142,621,306	49,913,141	82,528,465
3. Percentage of cost contributed				
By state	16.03	9.91	38.54	35.79
By communities	81.11	87.36	48.56	53.60
4. Average cost				
Per school	195.97	337.86	32.23	46.75
Per class	27.57	38.11	16.62	21.07
Per child	.47	.71	.30	.40
Per capita of population .	6.41	9.67	5.44	7.54
5. Total income of teachers . .				
Male	2,282,462	81,278,964	62,173,450	90,587,619
Female	8,984,671	19,996,533	4,120,765	7,839,999
6. Average income of teachers .				
Male	2,029	2,567	1,357	1,742
Female	1,361	1,700	1,132	1,370

To the figures for 1906 under No. 1, 11,110,091 M. ought to be added; this sum comprises contributions by the state for city and country schools which cannot be separated. The total expenditure for public elementary schools for 1906 thus amounts in Prussia to 328,319,147 M.

Cost of School Buildings (1906)

	Cities	Country	Together	1901
1. Current expenses for public elementary schools in 1905, without the cost of new buildings, repairs, or extensions	139,354,504	132,947,954	283,412,549	227,621,597
Salaries	111,208,768	107,670,644	229,989,503	186,873,192
Material equipment, etc. .	28,145,736	25,277,310	53,464,245	40,748,405
2. Cost of new buildings, repairs and extensions in 1905 . .	23,898,038	21,008,560	44,906,598	42,295,821
Amount of building debt for school buildings in June, 1906	110,428,352	99,499,637	209,927,989	155,288,394

Figures taken from *Statistisches Jahrbuch für den preussischen Staat*, Vol. XXX (1909).

The duty of maintaining the higher schools is not definitely determined by legislature in Prussia. So far as possible the towns maintain their own secondary schools, and frequently make it a matter of great pride to possess a highly developed system of education. Local politics also demands the creation of such a system in the growing towns, for this attracts settlers to the town. A few of the higher schools are under royal patronage and possess considerable endowments; a larger number are maintained by the state, but by far the largest belong to communities or towns. There are comparatively few private high schools for boys, although they are slowly increasing in number. Further details of the expenditure for this branch of education are indicated in the table on page 75.

The single expenditures of the state amounted to 1,408,560 M. in 1910 (*Etat*, p. 238); the amount spent locally it is impossible to give, but it was certainly far larger, since many new schools are being established, — more by the communities than by the state.

The higher education of girls has up to the present been mainly in the hands of private institutions, the number of which will in consequence of the recent regulations show a rapid decline, and the burden will fall almost entirely on the communities. The current expenses of the state for these schools amounted

Survey of the Permanent Income and Expenses of Higher Educational Institutions for Boys in Prussia, according to the Budget for 1910 (in Marks)

Types and Number of Institutions	Income					Expenditure			
	State Fund	Private Property	Private Revenue (Fees)	Municipal Fund	Endowment	Total Income also Total Expenditure	Payment Limit of Salaries	Remuneration for Instructors	Administration and Equipment
A. 5 institutions under royal patronage	60,765	688,235	320,298	——	147,321	1,216,620	556,452	20,360	639,808
B. 243 state-maintained institutions	14,516,441	773,395	9,078,194	1,276,092	637,914	26,282,039	22,848,327	677,478	2,756,233
C. 5 institutions maintained by the state and others in common . .	323,995	26,087	261,656	219,823	1,787	732,611	572,100	12,866	147,744
D. 466 institutions maintained by other means, but supported by the state and excluding institutions otherwise maintained	3,105,603	955,288	21,173,406	22,683,672	965,322	48,883,284	38,593,040	1,401,848	8,888,395
Total, including other small sums for 719 institutions . . .	17,916,154	2,443,006	30,833,555	24,178,848	1,752,346	77,123,011	62,569,920	2,112,553	12,441,437
Average per school .	24,918	3,397	42,884	33,628	2,437	107,265	87,023	2,038	17,303
Gymnasium at Steglitz near Berlin . . .	——	3,393	101,618	79,652	——	184,664	149,662	4,060	30,941
The 35 municipal schools in Berlin (with six and nine classes). (See D.) .	8,219	35,242	2,137,346	3,160,755	68	5,341,631	4,479,580	337,820	524,231

Figures from *Etat des Minister. d. geistl. etc., Angel. f. d. Etatsjahr* 1910, *Beilage*.

in 1910 to 1,079,583 M. (in 1906 only about 330,000 M.), single expenses are not yet to hand; the corresponding local expenditures cannot be given but were certainly very considerably higher.

ELEMENTARY AND INTERMEDIATE EDUCATION. — The lower schools (*öffentliche Volksschulen*, public, common, or elementary schools) are wholly public, and there are practically no private schools of this type. As a rule no fees are charged. Instruction begins at seven or eight in summer, and eight or nine in winter, and includes four or five, rarely six, periods a day. While the number of pupils may rise to a maximum of 1000 (a figure very rarely attained), the minimum number is small, and in remote places is from ten to twenty. Separate schools for boys and girls are maintained only in larger communities, where the number of pupils is large enough to warrant a separation, and this is the usual practice. (See above.)

The teachers by a large majority are men; in 1906 there were in Prussia 138,216 men and 23,708 women teachers. But the percentage of women teachers is gradually increasing The men teachers give from twenty-six to thirty or thirty-two lessons, the women twenty-two to twenty-six or twenty-seven per week. The division of schools into classes varies according to the size of a community. In the country single and two-class schools with one or two teachers are common, while in the towns systems with eight or nine classes and from twenty to thirty teachers have been developed. Some details are given in the following table (based on *Statist. Jahrb. f. d. preuss. Staat*, Vol. VII, 1910, p. 166):—

	In the Town		In the Country	
	1896	1906	1896	1906
Average per school of				
Classes	7.11	8.87	1.94	2.22
Teaching positions	7.05	9.02	1.55	1.80
Children	418	477	109	117
Average per teacher of				
Classes	1.01	0.98	1.25	1.23
Children	59	53	70	65
Average number of children per class .	59	54	56	53
Number of classrooms	30,090	42,882	50,221	59,565
Number of children not received on account of overcrowding	578	245	1831	674

Curriculum. — Such a variety of external conditions is naturally accompanied by a variety of curricula and standards in the individual schools. The single-class schools in which children of all ages are taught together, cannot perform the same type of work as the fully graded school. But all schools of whatever size must conform to certain minimum requirements, of which those of Baden may serve as an example, similar regulations being found in the other states: "The education of the elementary school shall train the children up to be intelligent, religious, and moral persons and upright members of the community. It must cover the following subjects: religion, reading and writing, German, arithmetic, singing, elements of geometry, geography, natural history, and nature study, and history, with physical exercises for boys, and for girls instruction in female handicrafts. The number of periods per week shall be at least sixteen, and from the fourth year on at least twenty, with a maximum of thirty for any class." The following time-table of the Berlin elementary schools may be taken as representative of a large school system: —

Course of Study of the Elementary Schools at Berlin

	VIII	VII	VI	V	IV	III	II	I
Religion . .	3	3	3	4	4	4	4	4
German . .	8	7	7	6	6	6	6	6
Object lessons	2	2	2	—	—	—	—	—
History . .	—	—	—	2	2	2	2	2 (2)
Arithmetic . .	4	4	4	4	4	4	4 (2)	4 (2)
Geometry . .	—	—	—	—	—	3 (0)	3 (2)	3 (2)
Nature study and science	—	—	—	2	2	4	4 (3)	3
Geography .	—	—	—	2	2	2	2	2
Drawing . .	—	1	2 (1)	2	2	2	2	2
Writing . .	—	2	2	2	2	1	1	1
Singing . .	1	1	2	2	2	2	2	2
Gymnastics .	2	2	2 (1)	2	2	2	2	2
Sewing, needle-work	—	—	(2)	(2)	(2)	(3)	(4)	(4)
Total . .	20	22	24	38 (30)	28 (30)	32	32	32
	Lower Stage			Middle Stage		Upper Stage		

(The figures in brackets denote deviations in the girls' schools.)

The work of these schools may be indicated by the scope of some subjects in the upper grades of a Berlin elementary school: —

German: the pupils must attain to thorough soundness in oral and written use of the vernacular. Complete thoroughness in orthography and the elements of grammar are expected and reached.

Arithmetic for Class II includes the rule of three, sums with compound numbers, proportion, calculations of everyday life, excluding exchange, discount, and partnership, together with insurance. Class I: exchange, discount, and partnership; comprehensive and final drill in calculations of everyday life; arithmetic and algebra (except in girls' schools); the theory of denominate numbers; algebraical addition, subtraction, multiplication, and division; proportion; equations of the first degree with one or more unknowns.

Nature study (physics) in the boys' schools, Class II: lessons in inorganic chemistry and mineralogy; magnetism; electricity; galvanism. Class I: completion of inorganic chemistry; introduction to organic chemistry; mechanics completed; sound and light. In the girls' schools, Class II: Lessons in organic chemistry, especially in its application to foodstuffs; elements of mechanics of solid, liquid, and gaseous bodies. Class I: magnetism; electricity; galvanism; sound; light.

Little can be said about the methods of instruction. The teachers are somewhat more restricted than in the high schools, yet not so much as to crush individuality. Closer insight into the methods can only be secured by visiting the classrooms and a study of the textbooks.

The elementary schools do not grant any privileges in the same sense as the higher schools. Some workingmen's guilds demand that their apprentices shall have completed the first class of the elementary school; and such requirements are laid down occasionally in other occupations. The tables given below, compiled from various sources, give additional statistics of elementary education in the most important German states and the Empire as a whole.

Special Provisions for Abnormal and Supernormal Children. — In an increasing number of towns special schools or classes are being established for the backward (*Schwachbegabte*). In 1905 such arrangements existed in 97 Prussian communities with a school population of

Statistics of German Elementary Schools

A. 1901 or 1900; B. 1906

	Number of Schools			Number of Male Teachers			Number of Female Teachers		
	A	*B*	Increase per cent	*A*	*B*	Increase per cent	*A*	*B*	Increase per cent
Prussia	36,756	37,761	2.7	76,342	84,980	11.3	13,866	17,784	28.3
Bavaria	7,280	7,434	2.1	12,184	12,559	3.1	2,715	3,861	42.2
Saxony	2,273	2,304	1.4	10,003	12,068	20.6	401	653	62.8
Württemberg . . .	2,353	2,382	1.2	4,615	4,890	6.0	494	615	24.5
Baden	1,677	1,688	0.7	3,631	3,983	9.7	418	856	104.8
German Empire . .	59,187	60,584	2.4	124,027	137,213	10.6	22,513	29,384	30.5

	Total Number of Teachers			Number of Pupils			No. of Pupils per Teacher		Percentage of Men and Women holding Full Time Appointments			
									A		*B*	
	A	*B*	Increase per cent	*A*	*B*	Increase per cent	*A*	*B*	Men	Women	Men	Women
Prussia . . .	90,208	102,764	13.9	5,670,870	6,164,398	8.7	63	60	85	15	83	17
Bavaria . .	14,899	16,420	10.2	873,399	958,037	9.7	59	58	82	18	76	24
Saxony . . .	10,404	12,721	22.3	655,771	775,098	13.0	66	61	96	4	95	5
Württemberg .	5,109	5,505	7.8	295,325	315,778	6.9	58	57	90	10	89	11
Baden . . .	4,849	4,039	19.5	273,149	308,884	13.1	67	64	90	10	82	18
German Empire	146,540	166,597	13.7	8,924,799	9,737,262	9.1	61	58	85	15	82	18

1,224,146. The following table gives the number of classes and pupils specially provided for:

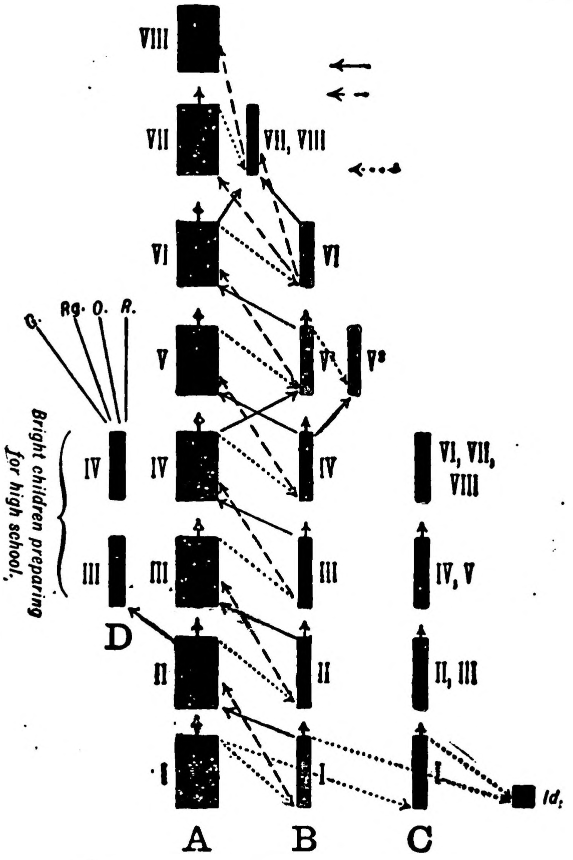
		Boys	Girls	Total
Special classes in public schools	184	1837	1418	3255
Number of classes in separate schools	388	5084	4044	9128
Total	672	6921	5452	12,383

Time-table in a Special School at Halle

Subjects	V	IV	III	II	I
Religion	3	3	3	2	2
Arithmetic	4	4	4	4	4 (5)
German	—	6	6	7	7
Writing	—	2	2	1	1
Object lessons	9	4	4	—	—
Drawing	—	—	1	2	2 (1)
History	—	—	—	2	2
Geography	—	—	—	2	2
Natural history	—	—	—	2	2
Singing	—	1	2	2	2
Gymnastics	2	2	2	2	2
Manual work	4	4	4	4	4
	22	26	28	30	30

The Mannheim system created by Superintendent Sickinger has aroused considerable attention and much imitation. It not only provides for schools for backward, but also attempts to provide special means for the education of the very bright and gifted pupils. This aim is attained by dividing the school system not only vertically into classes, but horizontally into various types of classes and institutions, and by assigning children to different schools not alone according to the districts in which they live, but according to their ability. By this system the very able children come after two years' attendance at school into classes which prepare them in one and a half years for the gymnasium. Pupils above the average have a richer curriculum, including a foreign language; the normal pupils go through the usual eight years' course; while the backward and dull receive courses of from four to seven years.

The following table gives a schematic view of the whole system, the eighth class being the lowest: —



Column *A*. Regular grades containing more than 90% of the pupils.
Column *B*. Grades for temporary aid.
Column *C*. Auxiliary grades or special schools.
Column *D*. Preparatory classes of high schools.
Id. Institution for idiots. *G.* Gymnasium. *Rg.* Realgymnasium.
O. Oberrealschule. *R.* Reformgymnasium.
←— Regularly promoted.
<– Placed temporarily in separate classes for individual attention and returned to regular grades.
<--- Placed in special classes owing to defective mentality.
(From Maennel, *The Auxiliary Schools of Germany.*)

Public Middle Schools in Prussia, 1901 and 1906. (See p. 78.)

	Boys		Girls		Mixed		Total	
	1901	1906	1901	1906	1901	1906	1901	1906
Number of schools	217	202	137	137	102	120	456	459
Number of classes	1,605	1,659	1,279	1,408	875	1,140	3,759	4,207
Number of teachers	1,682	1,750	1.406	1,579	895	1,212	3,983	4,544
Number of assistant teachers	266	292	295	263	152	188	713	743
Number of pupils	57,082 + 96 in girls' schools	57,295 + 8 in girls' schools	47,680 + 6 in boys' schools	49,603	16,371 boys 13,512 girls	20,140 boys 17,578 girls	73,549 boys 61,192 girls	78,443 boys 67,187 girls
Current expenses in marks	5,645,985	6,540,017	4,207,225	5,198,082	2,663,421	4,092,858	12,516,631	15,830,957
Average cost:								
per school	26,018	32,376	30,710	37,942	26,112	34,107	27,449	34,490
per class	3,518	3,942	3,289	3,692	3,044	3,590	3,330	3,760
per pupil	99	114	88	105	89	106	93	109

Middle Schools (Mittelschulen, Bürgerschulen, or Higher Elementary Schools).— This type of schools is intermediate between the elementary and higher schools, and is distinguished from both chiefly in teaching not more than one foreign language. While they are very frequent in the South German States, such as Baden, and in Saxony, and there form an important part of the school system, they are not so well developed in Prussia, as is indicated in the table at bottom of page 77.

It will be seen from this table that there are middle schools for boys, for girls, and for both together. The expenditure on this type of schools is much less than for higher or elementary schools. The reason for the comparative failure of these schools in Prussia, although such an intermediate stage was really a strong necessity, was that they did not convey any privileges nor prepare for or articulate with the higher schools. New courses of study were, however, issued in 1910 for Middle Schools which mark a great step in advance. While privileges were not granted to these schools, the curriculum has been so arranged that it can prepare for the higher schools. They comprise nine classes or years, and are based on the elementary school in so far as both have a common course in the lower stage. Fees are charged, but a suitable number of free places are maintained. Except in the lower stage there is an average of five periods per day. Good pupils may study a second language from the seventh school year on. In principle every pupil is expected to take only one compulsory subject. By the establishment of minimum and maximum standards, every school has sufficient scope to adapt the curriculum to special needs. These are new principles in the Prussian educational system; moreover the new schedules approach much more nearly to the principle of election and elasticity than any other part of the system. They are accordingly given here in greater detail.

Training of Elementary School Teachers. — Special institutions have been established for the professional training of teachers for elementary schools, distinct for males and females. The normal schools for men are part of the elementary school system. Between the elementary school and the normal school there is an intermediate school, the preparatory institution (*Präparandenanstalt*). Normal schools and preparatory institutions (of which there are at present only a very few for girls) are usually residential institutions (*Internate*). The preparatory institutions are either attached to or separated from the normal schools proper. They receive pupils from the elementary schools at the age of fourteen and keep them for three years. Attendance at the preparatory institution is not a requirement for entrance to the normal school, and candidates may prepare privately, but must show by examination "that they have attained the knowledge and ability specified in the course of study for preparatory institutions." The transfer from a higher or middle school to the institutions for the training of teachers is, in Prussia at any rate, not provided for, and pupils who wish to transfer must pass an entrance examination for admission to the class they wish to enter. Pupils come in some cases from a middle or real school, but rarely from a higher school. The course of study of both institutions is given in the following scheme; the normal schools for women deviate somewhat, but only slightly, from this.

COURSE IV

For a Middle School preparing for a Higher School

Subject	Middle School[1]							Schools with a Common Foundation																		Higher Girls' School					
	Classes							Gymnasium Classes						Realgymnasium Classes						Realschule and Oberrealschule											
	6	5	4	3	2	1	Total	6	5	4	U3	O3	Total	6	5	4	U3	O3	Total	6	5	4	U3	O3	Total	7	6	5	4	3	Total
Religion	2	2	2	2	2	2	12	3	2	2	2	2	11	3	2	2	2	2	11	3	2	2	2	2	11	3	3	3	2	2	13
German	5	5	4	4 (5)	3 (4)	4	25 (27)	5	4	4	3	3	19	5	4	4	3	3	19	5	4	4	3	3	19	6	5	5	4	4	24
Latin	–	–	–	7	7	7	12	–	–	–	10	8	20	–	–	–	8	8	16	–	–	–	–	–	—	–	–	–	–	–	—
French	5	6	6	4	4	4(5)	29 (30)	6	6	6	3	4	23	6	6	6	4	4	26	6	6	6	6	6	30	6	5	5	4	4	24
English	–	–	–	4	4	4	12	–	–	–	–	–	—	–		–	—	—	—	–	–	–	5	4	9	–	–	–	4	4	8
History	}2	3	4	3 (4)	3 (4)	3(4)	18 (21)	2	2	6	3	3	17	}2	2	6	3	3	16	–	–	3	2	2	17{ 7	–	2	2	2	2	8
Geography	–	–	–	–	–	–	—	–	–	–	–	–	—	–	–	–	—	—	—	2	2	2	2	2	10	2	2	2	2	2	10
Mathematics	4	4	5	5	5	5	25	5	5	5	4	4	23	5	5	5	4	4	23	5	5	6	6	5	27	3	3	3	3	3	15
Nature study	2	2	3	2 (3)	3 (4)	3(4)	15 (18)	2	2	3	2	2	11	2	2	3	3	3	13	2	2	2	2	4	12	2	2	2	3	3	12
Writing	1	1	1	–	–	–	3	2	2	–	–	–	4	2	2	–	—	—	4	2	2	2	–	–	6	1	1	1	–	–	3
Drawing	2	2	2	2	2	2	12	–	2	2	2	2	8	–	2	2	2	2	8	–	2	2	2	2	8	2	2	2	2	2	10
Singing	1	1	1	1	1	–	15	2	2	–	–	–	4	2	2	–	—	—	4	2	2	–	–	–	4	2	2	2	2	2	10
Gymnastics for boys	3	3		3	3	3	18	3	3	3	3	3	15	3	3	3	3	3	15	3	3	3	3	3	15	–	–	–	–	–	—
Needlework for girls	2	2	2	2	2	2	12	–	–	–	–	–	—	–	–	–	—	—	—	–	–	–	–	–	—	2	2	2	3	3	12

[1] The numbers in brackets denote the number of periods possible when English is taken in place of Latin.

TIME-TABLE PREPARATORY INSTITUTIONS AND NORMAL SCHOOLS

	Preparatory Institutions			Normal School		
Class	III	II	I	III	II	I
Pedagogy	—	—	—	3	3	3
Lesson-planning and model lessons	—	—	—	—	4[1]	4[1]
Practice teaching	—	—	—	—	—	4–6
Religion	4	4	3	3	4	3[2]
German	5	5	5	5	5	3[2]
Foreign languages	3	3	3	2	2	2
History	2	2	3	2	2	2
Mathematics	5	5	5	5	5	1[3]
Science and nature study	2	4	4	4	4	1[3]
Geography	2	2	2	3	2	1[3]
Writing	2	2	1	—	—	—
Drawing	2	2	2	2	2	1
Gymnastics	3	3	3	3	3	3[3]
Music	3	4	5	4	4	4
Agriculture	—	—	—	1	1	—
	34	37	37	38	38	33–35

[1] Included with subject matter.
[2] One hour for method.
[3] Method.

The requirements in the normal schools are given in detail in a few subjects and classes: —

I. *Pedagogy.* (A) Theory of Education. First year (3 hours a week). — General instruction in psychology and logic and their application in didactics and methods. Second year (3 hours a week). — Theory of education; history of education from the second semester. Third year (3 hours a week). — Continuation of history of education up to the present time. School organization, hygiene, management, and regulations. Advice in regard to further study after graduation.

(B) Training in School Practice. Second year. — In connection with model lessons in the practice school given by the practice teachers the students of the normal school are given opportunities all through the year to give lessons which they have prepared, and they receive instructions as to how to proceed. Third year. — All the students of this third grade are intrusted with giving lessons and acting as class teachers in the practice school throughout the year under supervision of the regular instructor. Each student must have from four to six hours a week of independent teaching. Two hours a week are to be devoted by the students to preparing lessons with attention to method and subject matter, criticizing lessons given by the students and discussing the school plant, administration, discipline, etc. Besides, these two periods are set aside for model lessons and practice lessons to be given in the different branches by the practice teachers, in which didactics or methods are exemplified. The normal students also are required to attend the lessons given by their colleagues according to previously determined rotation. The practice and special teachers are to familiarize the students with the methods used in each branch of study.

* * *

III. *German Language and Literature.* — Third year (3 hours a week). — The most notable contemporaries of Goethe and Schiller in connection with their works and their time. Some of the noted modern poets in biographies and in connection with the reading of their works. The German folk song. Dramas: *Wallenstein* and one drama of Shakespeare. Prose reading, preferably Herder's and Schiller's prose works. Home compositions once a month. Two compositions in class. Methods of teaching: One hour a week throughout the year.

IV. *Foreign Languages.* (A) French. First year (2 hours a week). — Review and completion of accidence; the position of words; the use of tenses. Reading: Simple stories in prose; easy poems. Second year (2 hours a week). — The uses of moods; infinitive and participles; declensions and words governing cases. Reading: Easy historic prose author of modern times; poems. Third year (2 hours a week). — Syntax completed and reviewed. Reading: Some historians of modern times; poems.

* * *

VI. *Mathematics.* (A) Arithmetic and Algebra. First year (3 hours a week). — Powers and roots, logarithms, equations of the first degree with several unknown quantities. Second year (3 hours a week). — Equations of the second degree. Arithmetical and geometrical progressions. Compound interest, computing revenues, annuities, etc. Third year (1 hour a week for arithmetic, algebra, and geometry). — Methods of teaching arithmetic and geometry.

(B) Geometry. First year (2 hours a week). — Proportionality of straight lines and similarity of figures. Stereometry. Second year (2 hours a week). — Continuation of stereometry; construction of algebraic formulæ; trigonometric functions and computation of plane figures. Third year (1 hour a week). — See above.

At the end of the course the first teachers' examination is held at the normal school in the presence of a commissioner of the government, the regulations for which are as follows: —

The standards of knowledge and ability which are to be required are defined by the course of study of the normal school. The written examinations include: (1) an essay on a topic taken from the theory of education or method, history of education, or German literature; (2) and (3) the preparation of an essay in religion and one in history; (4) a translation from the foreign language into German; (5) the preparation of a chorale for those who have taken lessons in organ playing and harmony. For the first essay four hours, for the rest two hours are allowed. The oral examination deals with the positive knowledge in pedagogy, religion, German, history, and the foreign language; and methods of different subjects of the elementary school. Further, those students who showed at the promotion from the second to the third class an unsatisfactory knowledge in nature study and geography are also to be examined in these subjects. A model lesson must be presented.

Candidates prepared outside the normal schools must be examined in all the subjects of the curriculum.

The first examination, however, is not a qualification for appointment as teacher. Such qualification is only obtained by the second examination, which may be passed not less than two nor more than five years after the first. This is not a repetition of the first examination, but aims to discover the ability of the candidate to hold a school appointment. The examination consists of three parts: the written work, which consists in the preparation of an essay on an educational subject; this is followed by the presentation of a lesson on a topic assigned one day in advance; and the oral examination, which begins with pedagogy covering mainly the history of education, principles and method, and school management; the examination in method may include all the subjects of the elementary curriculum, but, as a rule, each candidate is only examined in three subjects. On passing this examination the candidate receives a certificate for permanent appointment as teacher in the elementary school.

Two further examinations may be taken by the teachers. The examination for teachers in middle schools qualifies for appointment in middle schools and girls' high schools. The examination for principals, which may only be taken after that for middle school teachers, qualifies for appointment as director or instructor in normal schools, district school inspector, director of preparatory institutions, middle schools, and elementary schools with six or more classes.

The examination for middle school teachers consists of pedagogy and two of the following subjects: religion, German, French, English, history, geography, mathematics, botany and zoölogy, physics and chemistry. A thesis, for which eight weeks are allowed, must be prepared by each candidate on a topic from one of his two subjects. Further, there is a written examination of four hours on the two subjects. The oral examination consists of the presentation of a lesson, and an examination in pedagogy and the two selected subjects.

The principal's examination covers only the field of education in its broader sense. A topic is assigned for a thesis, for which eight weeks are allowed, on the theory and method of education and school management. The oral examination covers the whole field of general theory and method, special method of the separate subjects, their history, school ordinances and school management, school apparatus, and aids for instruction, popular and children's literature, etc.

Continuation Schools (*Fortbildungsschulen*). — These schools do not form a part of the school system proper, and differ from that in organization and aims. For further treatment see Continuation Schools; Evening Schools; and especially Industrial Education.

SECONDARY EDUCATION. — The school year is divided in the same way as the elementary schools. In Bavaria, however, the school year runs from the end of September to the beginning of July. School opens, as a rule, at 7 or 7.30 in summer, at 8 or 8.30 in winter, with five or six periods of forty-five to fifty minutes; occasionally there are some afternoon periods. In the smaller towns there are often four periods in the morning and one or two in the afternoon. The size of the schools is smaller than in America, the maximum, which is rarely reached, being probably 1000 pupils, 400 to 500 being the normal number, while schools with 150 pupils are rarely found.

The higher education of boys and girls is quite distinct, and the two have developed historically along different lines. In a few states (Baden, Hesse, Württemberg) the girls are admitted to the boys' schools, and the tendency to admit girls to boys' schools in small towns, where the numbers are not great enough to call for separate schools for girls, is gradually, but surely, making itself felt.

The boys' high schools are, as a rule, public, there being very few private schools. The entrance requirements are the successful passing of the third or fourth class in the elementary school. Frequently preparatory schools which do this work in three years are attached to the high schools; such schools (*Vorschulen*) in which fees are charged are preferred by the wealthier classes. Every high school is divided into six or nine classes or school years. In the larger institutions each class is duplicated, — the autumn class for those pupils who are promoted in October, and the Easter class for those who are promoted at Easter. In Baden promotions take place only once each year, in July, and the classes are then divided into parallel sections. The following are the names of the classes, their abbreviated form, and the age of entrance into each: —

Lower Stage	Sexta	VI	9
	Quinta	V	10
	Quarta	IV	11
Intermediate Stage	Untertertia	U III	12
	Obertertia	O III	13
	Untersekunda	U II	14
Upper Stage	Obersekunda	O II	15
	Unterprima	U I	16
	Oberprima	O I	17
	Abiturientenexamen		18

Thus VI O is the Easter group of Sexta; U I M the Michaelmas group of Unterprima. Parallel classes, as, for instance, VI O and VI O_2, are found only in exceptional cases where the classes are too large. The three stages as a rule form one institution, although there are schools consisting of only the lower and middle stages. Every class is passed in a year, and it is very rarely that a pupil can accomplish the work of a class in half a year, nor is this encouraged. Those who do not reach the standard of a class, that is, are deficient in two major subjects, fail of promotion and repeat the work of that class for a whole year. Promotions are by classes and never by subjects, and are made on a pupil's standing for the whole year and on the opinion of the teacher; examinations for this purpose rarely take place. The marking is at present on the following basis: 1, very good; 2, good; 3, satisfactory; 4, deficient; 5, unsatisfactory. In a few states another mark, 3, good as a whole, is inserted between 2 and 3, and 6 becomes the lowest. Generally a pupil fails of promotion when he is deficient in two major subjects. The maximum size of a class is 50 in the lower, 40 in the intermediate, and 30 in the upper, stage. These numbers are frequently reached in the lower, rarely in the upper, stage. If more pupils enter a class, then a division into two parallel classes is made.

Curriculum. — There are three types of higher schools with nine-year courses: the gymnasium, the oldest form, with the classical languages as the distinguishing characteristic; the realgymnasium, with Latin, modern languages and natural science; the oberrealschule, without Greek or Latin, but with the modern languages and stronger emphasis on mathematics. German, mathematics, history, and religion are common to all. The following time-tables of the three kinds of schools in Prussia show the distribution of the subjects and the number of periods of recitations each week:

GYMNASIUM

	VI	V	IV	U III	O III	U II	O II	U I	O I	Total
Required:										
Religion	3	2	2	2	2	2	2	2	2	19
German	4	3	3	2	2	3	3	3	3	26
Latin	8	8	8	8	8	7	7	7	7	68
Greek	—	—	—	6	6	6	6	6	6	36
French	—	—	4	2	2	3	3	3	3	20
History	—	—	2	2	2	2	3	3	3	17
Geography	2	2	2	1	1	1				9
Arithmetic and Mathematics	4	4	4	3	3	4	4	4	4	34
Natural science	2	2	2	2	2	2	2	2	2	18
Writing	2	2	—	—	—	—	—	—	—	4
Drawing	—	2	2	2	2	—	—	—	—	8
Gymnastics	3	3	3	3	3	3	3	3	3	27
Singing[1]	2	2	2	2	2	2	2	2	2	18
	30	30	34	35	35	35	35	35	35	304
Optional:										
Drawing						2	2	2	2	
Hebrew							2	2	2	
English							2	2	2	

---

[1] From IV onward only for pupils with vocal ability.

The brackets denote the possibility of a temporary alteration of number of periods within the same group of subjects. In classes IV and U III a special class is arranged for pupils whose handwriting is bad.

The following changes in the curriculum are admissible. In O II, U I, and O I, English may take the place of French, in which case French may remain an optional subject with two hours a week. In U III, O III, and O II, other subjects may be substituted for Greek; in which case three hours are given to English, and generally in U III and O III two hours to French, and one hour to arithmetic and mathematics, while in U II one hour is given to French and two to mathematics and natural science.

REALGYMNASIUM

	VI	V	IV	U III	O III	U II	O II	U I	O I	Total
Required:										
Religion	3	2	2	2	2	2	2	2	2	19
German	4	3	3	3	3	3	3	3	3	28
Latin	8	8	7	5	5	4	4	4	4	49
French	—	—	5	4	4	4	4	4	4	29
English	—	—	—	3	3	3	3	3	3	18
History	—	—	2	2	2	2	3	3	3	17
Geography	2	2	2	2	2	1	—	—	—	11
Arithmetic and Mathematics	4	4	4	4	5	5	5	5	5	42
Natural science	2	2	2	2	2	4	5	5	5	29
Writing	2	2	—	—	—	—	—	—	—	4
Drawing	—	2	2	2	2	2	2	2	2	16
Singing [1]	2	2	2	2	2	2	2	2	2	18
	30	30	34	35	35	35	36	36	36	307
Optional:										
Geometrical drawing					2	2	2	2	2	

[1] As in the Gymnasium.

OBERREALSCHULE

	VI	V	IV	U III	O III	U II	O II	U I	O I	Total
Required:										
Religion	3	2	2	2	2	2	2	2	2	19
German	5	4	4	3	3	3	4	4	4	34
French	6	6	6	6	6	5	4	4	4	47
English	—	—	—	5	4	4	4	4	4	25
History	—	—	3	2	2	2	3	3	3	18
Geography	2	2	2	2	2	1	1	1	1	14
Arithmetic and Mathematics	5	5	6	6	5	5	5	5	5	47
Natural science	2	2	2	2	4	6	6	6	6	36
Writing	2	2	2	—	—	—	—	—	—	6
Freehand drawing	—	2	2	2	2	2	2	2	2	16
Gymnastics	3	3	3	3	3	3	3	3	3	27
Singing [1]	2	2	2	2	2	2	2	2	2	18
	30	30	34	35	35	35	36	36	36	307
Optional:										
Geometrical drawing						2	2	2	2	

[1] As in the Gymnasium.

The extent of the knowledge which is to be transmitted will be indicated through the scope of the curriculum of the highest class in a few of the chief subjects and through the requirements of the final examination. (Based on Lexis, Vol. II.)

Greek Subjects in Gymnasium. — Reading: Homer's *Iliad*, Sophocles, Euripides, Plato, selections from Thucydides, and Demosthenes; other prose valuable for content; appropriate selections of Greek lyric poetry. Grammar, revision, and recapitulations of the whole subject, as found necessary. Practice in unseen translation. Written translations from and into Greek.

Latin in the Gymnasium. — Reading, 5 hours: Cicero (*e.g. in Verrem* IV or V, *pro Plancio, pro Sestio,* all with omissions, *pro Murena;* selections from Cicero's philosophical and rhetorical writings, also from his letters; Tacitus' *Germania* (at least till Chap. 27), also *Agricola,* or parts of the *Dialogue,* selections from the *Annales* (especially the sections referring to Germany) and from the *Histories;* selections from Horace; memorization of some of the *Odes.* Occasionally, unseen translation. Private reading, especially also of writers read in previous classes, is to be encouraged and fostered, but is not required as obligatory. Grammar, 2 hours: revision with special attention to the more important and difficult syntactical rules; recapitulating explanations of specially prominent stylistic peculiarities. Translation into Latin, written class and home exercises.

The requirements in Latin in the realgymnasium are somewhat lower.

French in the Realgymnasium — The reading, which, as in the gymnasium, occupies a central position, is treated more extensively and intensively than in the latter, so that the pupils may acquire a broader notion of the special qualities of French literature in the last centuries, as well as some knowledge of the national culture and character. Revision and completion of the more important sections of the grammar. An outline of the laws of versification. The essentials of synonymy and of the laws of style. Extension of the vocabulary, including also technical and scientific terms. Written and oral exercises. Exercise in essay writing, from frequent brief production of what has been read, up to a freer treatment of definite concrete subjects. Conversational exercises at every lesson, not merely in connection with the reading and incidents of daily life, but also on the history, literature, and culture of the French nation.

French in the Oberrealschule. — In these schools the teaching aims at imparting a knowledge of the more important French writings of the last three centuries, insight into the grammatical system of the language, some knowledge of the most important sections of French literary and social history, and practice in speaking and writing.

The scope in English is similar, although essays are not required in this language. The scope of these subjects is correspondingly smaller in the gymnasium.

Arithmetic in the Realgymnasium and Oberrealschule. — Theory of combinations, and application to the theory of probability. The binomial theorem for any exponents, and the simplest infinite series. Repetition and continuation of the arithmetical course (extension of the notion of numbers by algebraical operations, from the positive integral to the complex number). Cubic equations. Elementary exercises in maxima and minima. Spherical trigonometry with application to mathematical geography and astronomy.

Geometry. — Elements of descriptive geometry. The most important problems in conic sections in elementary-synthetical treatment. Analytical plane geometry. Revision, recapitulation, and exercises in all branches of the subject taught in previous classes.

Methods of Teaching. — No account can here be given of the methods of instruction in the German schools; an insight into them can only be obtained by a visit to the schools and by a study of the textbooks. General regulations on method are found only to a small extent; like the choice of textbooks, the method of teaching is left to the individual schools. Since school inspection, which might serve to secure uniformity, is very slight in higher education, the variety found in teaching is exceedingly great, and a somewhat firmer restriction placed on the individual teacher would at times not be out of place. A certain amount of uniformity is secured within each institution through the use of the same textbook by different teachers, and in the system itself through the prescription of definite aims whose attainment is assured by means of the final examination, at which an inspector is frequently present.

Progymnasiums and realprogymnasiums, which are not very numerous, and the very numerous real schools have each the same curriculum, differing only in that they lack the three, occasionally (especially in Baden) the two, highest classes. Only the Berlin real schools have a somewhat different curriculum for purposes of better articulation with the common schools. French is here begun in Quarta, and more attention is given in the lower stage to arithmetic and mathematics.

Reform Schools. — From the accompanying table it can be seen that the transition from the gymnasium to the realgymnasium is quite possible in the first three years, but a change from the oberrealschule and the realschule to the gymnasium or realgymnasium or vice versa is entirely impossible. Hence parents must decide quite early, when their children are nine or ten years of age, on the type of school to which they are to be sent. The feeling that it would be better to postpone a decision which is irrevocable has led to the organization of the reformgymnasium and realgymnasium. A common foundation is laid for the three types of high schools, for which purpose the lower stage of the real school or oberrealschule is employed. At the end of three years there is a bifurcation; one section begins English and continues later with a stronger emphasis on natural sciences (realschule and oberrealschule), the other begins Latin; and after two years is again split up, the one division (gymnasium) beginning Greek, the other (realgymnasium) English. This is the Frankfort system, from which that of Altona deviates somewhat. According to this system either separate institutions may be established for the three types of schools, gymnasium, realgymnasium, realschule, or oberrealschule, or two or three different types may be united into one institution. The following is the time-table of an institution consisting of a reformgymnasium and realgymnasium (the Leibnitz School at Hanover, where also a special method is employed in teaching Greek, the pupils beginning with the Homeric dialect and poems in U II, and going on to the Attic dialect in O II): —

The following scheme shows a combination of the realgymnasium with the real school according to the Altona system: —

TIME-TABLE OF THE REALGYMNASIUM AND REALSCHULE IN ALTONA

	Foundation			Realschule			Realgymnasium						Total for Foundation and Realgymnasium
	VI	V	IV	III	II	I							
Required:													
Religion . .	3	2	2	2	2	2	2	2	2	2	2	2	19
German . .	5	4	4	3	3	3	2	2	3	3	3	3	29
Latin . . .	—	—	—	—	—	—	6	6	6	6	6	6	36
French . .	6	6	5	6	5	5	4	4	3	3	3	3	37
English . .	—	—	4	5	4	5	3	3	3	3	3	3	22
History . .	—	—	2	2	2	2	2	2	2	3	3	3	17
Geography .	2	2	2	2	2	1	2	1	1	—	—	—	10
Arithmetic .	—	—	3	2	1	1	1	—	—	—	—	—	}44
Mathematics	5	5	3	4	5	5	4	4	5	4	5	5	
Physics . .	—	—	—	—	2	3	—	2	2	3	2	2	11
Chemistry .	—	—	—	—	—	2	—	—	—	2	2	2	6
Nature study	2	2	2	2	2	—	2	2	2	—	—	—	12
Writing . .	2	2	—	—	—	—	—	—	—	—	—	—	4
Drawing . .	—	2	2	2	2	2	2	2	2	2	2	2	16
Gymnastics .	3	3	3	3	3	3	3	3	3	3	3	3	27
Singing . .	2	2		3 Choral Singing									25
	30	30	35	36	36	37	36	36	37	37	37	37	315
Optional:													
Geometrical drawing .	—	—	—	—	—	—	—	2	2	2	2	2	
Spanish . .	—	—	—	—	2	2	—	—	2	2	2	2	

TIME-TABLE OF THE LEIBNITZ SCHOOL IN HANOVER GYMNASIUM AND REALGYMNASIUM WITH A COMMON FOUNDATION

	Foundation					Realgymnasium					Gymnasium				
	VI	V	IV	U III	O III	U II	O II	U I	O I	Total	U II	O II	U I	O I	Total
Required:															
Religion . . .	3	2	2	2	2	2	2	2	2	19	2	2	2	2	19
German . . .	5	4	4	3	3	3	3	3	3	31	3	3	3	3	31
Latin	—	—	—	10	10	5	5	5	5	40	8	8	8	8	51
Greek	—	—	—	—	—	—	—	—	—	—	8	8	8	8	32
French . . .	6	6	6	3	3	4	4	3	4	39	2	2	2	2	32
English . . .	—	—	—	—	—	6	4	4	3	17	—	—	—	—	—
History . . .	}2	2 }	3	2	2	2	3	3	3	}30	2	2	2	3	}27
Geography . .			3	2	2	1	—	—	—		—	—	—	—	
Arithmetic . .	5	}5													
Mathematics .	—		5	4	4	4	5	5	5	42	3	3	3	3	35
Nature study .	2	2	3	2	2	—	—	—	—	11	—	—	—	—	11
Physics . . .	—	—	—	—	—	3	2	3	3	11	2	2	2	2	8
Chemistry . .	—	—	—	—	—	—	2	2	2	6	—	—	—	—	—
Writing . . .	2	2	—	—	—	—	—	—	—	4	—	—	—	—	4
Drawing . . .	—	2	2	2	2	2	2	2	2	16	—	—	—	—	8
Singing . . .	2	2	2	2	2	2	2	2	2	16	2	2	2	2	18
Gymnastics . .	3	3	3	3	3	3	3	3	3	27	3	3	3	3	27
	30	30	33	35	35	37	37	37	37	311	35	35	35	35	303
Optional:															
Hebrew . . .	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
English . . .	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2
Geometrical drawing . .	—	—	—	—	2	2	2	2	2	—	—	2	2	2	2

The aim and, as a rule, the methods of the reform schools are the same as in the corresponding schools of the old type. They are thus by no means new schools, but merely differ in postponing certain subjects in favor of others. Two principles are, however, adopted, new to the traditional German schools which had and still have a fixed course: these are the principles of a common foundation and of bifurcation. Two important changes are thereby effected; first the decision on the choice of an educational course is postponed for several years, and secondly more types of courses can be offered in the same institution and under the same direction. These principles find even wider application in the reform of girls' schools and middle schools. They indicate that the German educational system is gradually abandoning the principle of a fixed curriculum and is accepting the principle of election, — a movement of the highest significance. The Frankfort Plan was originated by Dr. Reinhardt, now at Berlin.

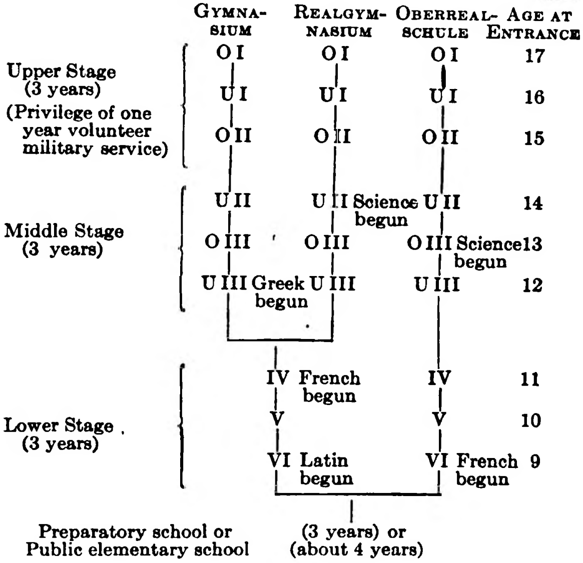
The tables in the next column show schematically the relations between, and the articulation of, the three types of higher schools in the old and reform system.

Leaving Examination (*Abiturientenprüfung*). — The requirements correspond to the program of instruction of Prima. The written examination comprises, for all the schools, a German essay and the working of four mathematical questions, each dealing with a different branch, further: (*a*) In the gymnasium: a translation from German into Latin, and another from Greek into German. (*b*) In the realgymnasium: a translation from Latin into German; according to the curriculum of each separate institution, a French or an English exercise, viz., either an essay or a translation from German; and a question in physics. (*c*) In the oberrealschule: a French and an English exercise, an essay in one of these two languages and a translation from German into the other language, and a question in physics or in chemistry.

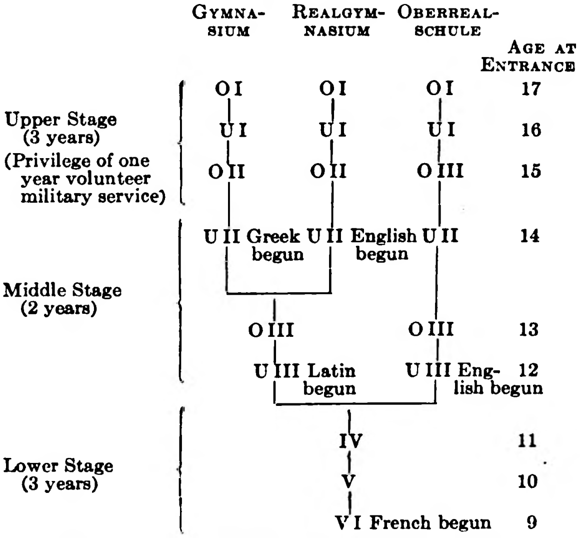
The oral examination comprises, for all the schools, Christian religious teaching, history, mathematics, and further: (*a*) in the gymnasium: Latin, Greek, and according to the curriculum of each separate institution, either French or English; (*b*) for the realgymnasium: Latin, French, and English, and physics or chemistry; (*c*) for the oberrealschule: French and English, and physics or chemistry.

Statistical. — The tables on page 84 will give some information on the number of the different schools, the number of teachers, of pupils, etc.; material of a more exhaustive and detailed character is not available.

A. ACCORDING TO THE OLD SYSTEM, THE CRITICAL POINTS BEING AT THE AGES OF 9 AND 11; AS A RULE EACH TYPE BEING A SEPARATE INSTITUTION


GYMNASIUM
REALGYMNASIUM
OBERREALSCHULE
AGE AT ENTRANCE
Upper Stage (3 years)
(Privilege of one year volunteer military service)
O I
O I
O I
17
U I
U I
U I
16
O II
O II
O II
15
Middle Stage (3 years)
U II
U II Science begun
U II
14
O III
O III
O III Science begun
13
U III Greek begun
U III
U III
12
Lower Stage (3 years)
IV French begun
IV
11
V
V
10
VI Latin begun
VI French begun
9
Preparatory school or Public elementary school
(3 years) or (about 4 years)

B. ACCORDING TO THE REFORM SYSTEM, THE CRITICAL POINTS BEING AT THE AGES OF 11 AND 13, TWO OR EVEN THREE TYPES FORMING ONE INSTITUTION


GYMNASIUM
REALGYMNASIUM
OBERREALSCHULE
AGE AT ENTRANCE
Upper Stage (3 years)
(Privilege of one year volunteer military service)
O I
O I
O I
17
U I
U I
U I
16
O II
O II
O III
15
Middle Stage (2 years)
U II Greek begun
U II English begun
U II
14
O III
O III
13
U III Latin begun
U III English begun
12
Lower Stage (3 years)
IV
11
V
10
VI French begun
9

The age at graduation in both systems is 18 or 19.

Privileges. — Two kinds of *Berechtigungen*, or of certificates that entitle the holder to certain important privileges, can be acquired in the higher schools: the certificate of admission for the one year volunteer service in the army, *Einjährigenschein*, and the certificate of maturity for higher professional studies, *Reifeprüfungszeugnis* or *Zeugnis der Reife für höhere Berufsstudien*.

a. The *Einjähigenschein* is obtained in the schools with a course of six years or classes (realschulen, etc.) by the final examination at the end of the course, in the schools with a course of nine years (the three preparatory years not counted in either case) or classes without an examination by the promotion from

PRUSSIAN HIGHER SCHOOLS ON FEB. 1, 1909[1]

Type of School	Number of Schools	Number of Teachers: Directors and Chief Assistants	Number of Teachers: Special and Elementary Teachers	Number of Teachers: Probation Teachers	Number of Pupils: O I	U I	O II	U II	O III	U III	IV	V	VI	Total
Gymnasium	336	4848	613	385	6068	7116	8724	11,461	12,486	13,215	14,560	14,020	14,646	102,297
Progymnasium	35	1851	37	20	—	—	—	510	576	740	828	838	905	4,497
Realgymnasium	138	1632	305	103	1338	1830	2748	4,360	5,050	5,853	6,417	6,577	7,029	41,202
Realprogymnasium	45	195	56	10	—	—	—	346	567	736	946	1,040	1,243	4,878
Oberrealschule	85	1212	259	96	898	1276	2144	3,504	4,286	4,823	5,614	5,976	6,214	34,735
Realschule	169	911	300	95	—	—	—	3,594	4,654	5,817	6,127	6,246	6,912	33,350

[1] From *Centralblatt*, etc., *Ergänzungsheft*, 1910, p. 50.

PRUSSIAN HIGHER SCHOOLS ON FEB. 1, 1908 (*A*) AND 1909 (*B*)[1]

	Gymnasium		Real-gymnasium		Ober-realschule		Pro-gymnasium		Realpro-gymnasium		Realschule		Total	
	A	*B*	*A*	*B*	*A*	*B*	*A*	*B*	*A*	*B*	*A*	*B*	*A*	*B*
Schools (including reform schools)	332	336	124	138	75	85	40	35	39	45	171	169	781	808
Teachers	6,262	6,388	2,029	2,243	1,526	1,716	318	287	250	312	1,540	1,501	11,925	12,447
Teachers in preparatory schools	353	356	180	199	137	155	3	1	26	35	138	126	837	872
Pupils	101,094	102,297	37,683	41,202	30,702	34,735	4946	4497	4225	4878	33,465	33,350	212,115	220,959
Pupils in preparatory schools	13,006	13,309	6,905	7,424	4,924	5,644	98	39	889	1177	5,009	4,898	30,831	32,441

OTHER STATES

	Gymnasium	Real-gymnasium	Ober-realschule	Pro-gymnasium	Realpro-gymnasium	Realschule	Total
Bavaria (1909)	46	4	9	32	—	51	141
Württemberg (1909)	14	5	10	5	7	88[2]	129
Saxony	19	12	2	—	—	30	

[1] From *Centralblatt*, etc., 1909. [2] Twenty-one of these schools have one or two upper classes (obersekunda and unterprima).

untersekunda to obersekunda, which takes place after successfully completing the first six years or classes of the whole course (of nine years). The most important privilege acquired by this certificate is the right of serving only one year in the army, whereas otherwise every German has to serve at least two years. The service is voluntary (*Einjährig Freiwilliger*) in so far as the time of service and the regiment may, within certain limits, be selected by the individual holding the privilege. This is of course of economic importance, but besides it means a social distinction, especially as the officers of the reserve, a much-coveted dignity, are taken from the *Einjährige* only. At the same time this certificate will show that the bearer possesses a certain amount of knowledge and intellectual training, and so a publicly and officially recognized standard of education is established by it which easily can and actually does serve as the entrance requirement for many official and private careers. So this certificate is the indispensable entrance requirement for the intermediate careers (as official or clerk) in the post office, telegraph and telephone service, in the service of the judicial, the provincial, and the local administration, and the state railway service (the higher careers being always filled by university-trained men, the lower ones with men who have had an elementary school training). In this respect the *Einjährigenschein* takes the place of the civil service examination in America. Large business houses and especially banks generally do not take apprentices who have not at least this certificate; sometimes they require even more. The natural result is that a large number of boys remain at school only for the purpose of getting this certificate and leave as soon as they obtain it (see the figures under U II and O II in table above).

b. The *Reifeprüfung* is the examination at the end of the full course of nine years of the three different types. It gives the right of admission to the careers of officer in the army and navy, and above all the right of admission to the universities and technical *Hochschulen*, that is, ultimately to the state examinations at the end of the university or technical course. So the *Reifeprüfung* is nearly the only entrance to all higher walks of life, and certainly to all higher positions of honor and trust in the service of the state; and the social recognition in which it is held is correspondingly high.

The criticism which is sometimes made by foreign observers of the system of privileges shows a failure to realize the function and the importance of this system. It certainly has drawbacks; it is a heavy burden on the boys and on their parents; it keeps many boys in school who ought not to be there any longer, and is therefore a burden on the school. But infinitely greater are its advantages for the life of the nation as well as for the work of the school. By this system definite educational standards are secured throughout the nation; in a reliable way it provides young men with a broad knowledge and thorough intellectual training for the higher as well as for the middle careers in life; it relieves the higher institutions of the burden of elementary work and lays a good foundation for their own work. It puts the examinations where they belong, — at the beginning and not at the end of the course; and though it sifts thoroughly, it avoids the tremendous waste of entrance examinations; it does not place the examinations in the hands of persons who have never seen the boy, but leaves him to his teachers, who have known and worked with him for years; and the boy is not judged by the written work of a few hours, but by the oral and written work of a year and by his whole personality. The system secures the willing, though not always the hearty, coöperation of the parents. Last, but not least, it exercises an automatic pressure on the boy, which causes him to work, — a pressure which otherwise the teacher would have to exercise by his personal efforts. Thus the school system becomes more efficient. It would be difficult to devise another system which could bring about these same results as economically and as thoroughly. Far from being the "bane of German secondary education," the system of privileges — *Einjährigenschein*, *Reifeprüfung*, *Staatsexamen* — is, therefore, the most important reason for the efficiency and thoroughness of the German schools, more important than even the preparation of teachers, which is partly secured only with the help of this system.

RESULTS OF THE REIFEPRÜFUNG IN PRUSSIA, EASTER, 1907–1908 [1]

	At the Gymnasiums		At the Realgymnasiums		At the Oberrealschulen	
	Michaelmas 1907	Easter 1908	Michaelmas 1907	Easter 1908	Michaelmas 1907	Easter 1908
Number registered for the examination	1120	5133	239	1053	117	745
Number not admitted or withdrawn	412		79		60	
Number examined	5841		1213		802	
Number passed	5622		1183		779	
Of those successful there were:						
Protestants	3397		971		648	
Catholics	1862		131		97	
Jews	357		77		27	
Number under 18 years of age	278		48		27	
18 years old	1497		356		206	
19 years old	1698		412		268	
20 years old	1127		220		186	
21 years and over	1022		147		92	
Number of successful candidates who went to the universities	4042		632		353	
To the technical high schools	487		204		164	
Entered military career	349		58		22	
Entered higher forestry, customs, postal and other state service	151		42		36	
Other occupations and undecided	593		247		204	

The externs, *Extraner*, those who prepared outside of the schools, are not counted in this list. In 1907–1908 at the gymnasiums 368 externs registered, for the examination of whom 253 were admitted and 150 passed; 88 of them were 21 years of age and over, and 85 entered a university. At the realgymnasiums the corresponding figures were, 205, 162, 123, 73, 61, and at the oberrealschulen, 186, 97, 67, —, 23.

Cadet Schools. — These schools are to be found in Prussia, Bavaria, and Saxony. They provide for the general training of future officers in the army and are generally boarding schools, with the curriculum of the realgymnasium combined with military practice. In Prussia there are eight preparatory institutions with lower classes (Sexta to Obertertia) only, and one central institution with the upper classes (Untersecunda to Oberprima), which is at Berlin-Grosslichterfelde. This horizontal division into lower and upper sections is a special feature of the cadet schools, distinguishing them from the other higher schools. In 1893 in Prussia the number of pupils in the preparatory institutions was 2470, in the central institution 1000. Many officers come also from the regular higher schools, with or without the *Reifezeugnis*. (See MILITARY EDUCATION.)

Higher Education of Girls. — For a long time the higher education of girls was not so well cared for as that of the boys, and at times it was almost neglected. But in recent years a strong reform movement has thoroughly reorganized these schools and placed them on a much higher level. Whereas most of them were formerly in private hands and were money-making institutions, a rapidly growing percentage is now supported by the communities; the state, at least the state of Prussia, supports only very few (see p. 74). As to promotion, division of school year, etc., see the general remarks on the higher schools for boys. The classes are generally named 10th class, 9th class, etc., the 1st class being the highest.

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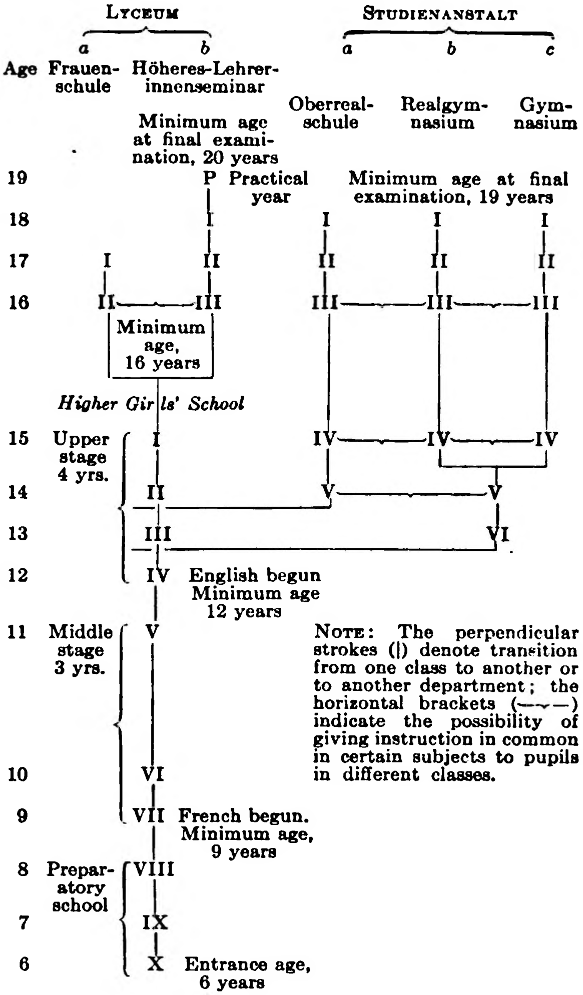
[1] From *Centralblatt*, etc., 1908.

Organization and Curricula. — There are separate higher schools for girls in all the states of the empire. Their curriculum, with the exception of mathematics and science, is not widely different from that of the realschulen, and, though frequently one year longer (10 years or 7 without the 3 years of the preparatory school), it is not quite so broad and the teaching not so thorough (partly on account of the absence of privileges, *Berechtigungen*). Those girls who desire to get an education equal to that of the boys or who wish to pass the *Reifeprüfung* are, in some of the smaller German states, either admitted to the boys' schools (as in Baden or Saxony), or to *Mädchen-gymnasien* or *real-gymnasien*, which are in no way different from the corresponding schools for boys in Baden. In Prussia, according to the regulations of 1908, the girls are not admitted to the boys' schools, and the new higher girls' schools are different from the boys' schools. As these regulations of 1908 will be the starting point for a new development and will be more or less adopted by other German states, their most important features must be given here.

In Prussia the higher girls' school proper contains a course of 10 years (or 7 without the 3 years of the preparatory school), which is nearly equal to the 9 (or 6 respectively) years of the realschule. On this course two others are built, both comprised under the name of *Lyceum:* one of two years, to be known as *Frauenschule*, a very undefined course; the other, one of four years, called *höheres Lehrerinnenseminar* (training college for women teachers at the higher girls' schools proper). After the seventh and eighth year of the higher girls' school proper three other courses branch off which lead to the different kinds of *Reifeprüfung*. These courses are known as *Studienanstalt*. The provision of adequate facilities for preparation, corresponding to the education of the gymnasium, will lead to the admission of women to the universities as fully recognized students, and has already led to new regulations, to take effect in 1913, of demanding university study from teachers in the higher girls' schools. (See Prettyman, C. W., Higher Girls' Schools in Prussia. *Teachers College Rec.*, May, 1911.) The influence of the Reform Schools and the principles therein expressed, a common foundation and bifurcation, will be easily recognized.

The following tables show the system, the articulation of its parts, and the different curricula: —


Lyceum
a
b
Age
Frauen-schule
Höheres-Lehrer-innenseminar
Minimum age at final examination, 20 years
Studienanstalt
a
b
c
Oberreal-schule
Realgym-nasium
Gym-nasium
Minimum age at final examination, 19 years
19
18
17
16
15
14
13
12
11
10
9
8
7
6
P Practical year
I
II
III
Minimum age, 16 years
Higher Girls' School
Upper stage 4 yrs.
IV
V
VI
English begun
Minimum age 12 years
Middle stage 3 yrs.
VII
French begun. Minimum age, 9 years
Prepar-atory school
VIII
IX
X
Entrance age, 6 years

NOTE: The perpendicular strokes (|) denote transition from one class to another or to another department; the horizontal brackets (—⌄—) indicate the possibility of giving instruction in common in certain subjects to pupils in different classes.

COURSE OF STUDY OF THE HIGHER GIRLS' SCHOOL PROPER

a. Literary and Scientific Subjects

	LOWER STAGE			MIDDLE STAGE			UPPER STAGE				TOTAL
	X	IX	VIII	VII	VI	V	IV	III	II	I	VII–I
1. Religion	3	3	3	3	3	3	2	2	2	2	17
2. German	10	9	8	6	5	5	4	4	4	4	32
3. French	—	—	—	6	5	5	4	4	4	4	32
4. English	—	—	—	—	—	—	4	4	4	4	16
5. History and Art History	—	—	—	—	2	2	2	2	2	3	13
6. Geography	—	—	2	2	2	2	2	2	2	2	14
7. Arithmetic and Mathematics	3	3	3	3	3	3	3	3	3	3	21
8. Natural Science	—	—	—	2	2	2	3	3	3	2	17
Total	16	15	16	22	22	22	24	24	24	24	162

b. Technical Subjects

9. Writing	—	3	2	1	1	1	—	—	—	—	3
10. Drawing	[1]	[1]	[1]	2	2	2	2	2	2	2	14
11. Needlework	—	2	2	2	2	2	[2]	[2]	[2]	[2]	6 (14)
12. Singing	[illegible]	[illegible]	[illegible]	2	2	2	2	2	2	2	14
13. Gymnastics	[illegible]	[illegible]	[illegible]	2	2	2	3	3	3	3	18
Total	2	7	6	9	9	9	7(9)	7(9)	7(9)	7(9)	55 (63)

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[1] In the classes X–VIII occasional drawing and clay modeling during the object lessons in German.

[2] Needlework is optional in the upper classes.

Course of Study of the Lyceum

A. *Frauenschule*

	II	I	Total	
1. Pedagogy	2	2	4	
2. Household Arts	5	5	10	Including practice in cooking and household management.
3. Kindergarten-teaching[1]	4	4	8	Including practice work in kindergarten.
4. Hygiene and care of children	4	4	8	Including practical work in crèches, day nurseries, and nursing.
5. Civics and economics	2	2	4	Including visits to philanthropic institutions and missions.
6. Bookkeeping (household)	1	1	2	
7. Needlework	2	2	4	
8. Religion				Each subject according to circumstances and needs; two hours each per week.
9. German				
10. French, English, Latin, or Italian				
11. History, Geography, Science				
12. History of Art				
13. Gymnastics				
14. Drawing and painting				
15. Music				

[1] Household arts and kindergarten teaching may be so arranged that in the first year only the former, in the second only the latter, are taken with 9 hours per week.

B. Training College for Teachers (*Höheres Lehrerinnenseminar*)

Academic Subjects	Academic Continuation Classes				Practical Year
	III	II	I	Total	
Religion	3	3	3	9	1[2]
German	3	3	3	9	3
French	4	4	4	12	1[2]
English	4	4	4	12	
History	2	2	2	6	1[2]
Geography	2	1	1	4	
Mathematics	4	4	4	12	1[2]
Natural Science	2	3	3	8	1[3]
Pedagogy	2	2	2	6	3
Method and Model Lessons			(4)[1]		4
Practice Teaching					4-6
Reports and Discussions					8
	26	26	26	78	26 (25–27)
Technical Subjects:					
Drawing	2	2	1	5	—
Singing	1	1	1	3	—
Gymnastics	3	3	1	9	3

[1] Method and model lessons in Class I are included in the periods given to each subject and are given in place of the respective subjects rather than as separate courses.
[2] Method and introduction to professional literature.
[3] Method and introduction to experimentation.

The curriculum of the *Studienanstalten* is almost the same as those of the corresponding boys' schools, but as the whole course lasts thirteen years (instead of twelve as in the boys' schools), the number of recitations per week is a little less. Those who have completed the course of any of the *Studienanstalten* may enter the highest class, practical year, of the Seminar.

The higher girls' school proper and the *Frauenschule* have no privileges; the *Reifeprüfung* at the end of the *Studienanstalten* grants the same privileges as that of the gymnasium, etc. As at present there are only about 35 *Studienanstalten* in Prussia, and as the girls are not admitted to boys' schools, many girls who desire a higher education can get it only with difficulty, especially in the smaller towns. Financial or other statistics in suitable form are not available; as the whole system of girls' schools is in a rapid process of reorganization and readjustment, it would in any case be useless to quote statistics.

Training of Teachers for the Higher Schools. — The teachers in boys' schools are men, most of them with university training; in the girls' schools there are partly men and partly women teachers, most of the women being trained in the training colleges mentioned above, though an increasing number of women are receiving the same university training as the *Oberlehrer*. Admission to the profession of teaching in all the states is dependent on the passing of a special examination for teachers in higher schools; *e.g.* in Prussia (*Prüfung für das Lehramt an höheren Schulen*), held by special examining boards and independent of the universities, and also a course of practical preparation of from one to two years. A university degree is not a qualification for a teaching appointment, although professors of the universities are frequently members of the examining boards.

The Examination in Prussia. — To be admitted to the examination a candidate must hold a certificate of graduation from a German higher school and must have studied for at least six semesters at a German university. As a rule the period of study lasts from four to five years or more. The examination consists of two parts, general and special, and both are written and oral. The subjects of the general examination are the same for all candidates and include: philosophy (the most important facts of its history, the chief principles in logic and psychology, the knowledge of an important philosophical work); pedagogy (the philosophical principles underlying the most important facts of its history since the sixteenth century); German literature (general development from the eighteenth century, the knowledge of a few important works); religion (content and coherence of the Bible, general outline of the history of the Christian church, the principal doctrines of the denomination of the candidate). In the special examination there must be one of the following combinations: Latin and Greek; French and English or Latin; history and geography; religion and Hebrew, Greek, or German; pure mathematics and physics; chemistry, including mineralogy, and physics, or, in place of physics, botany and zoölogy. Other possible subjects are applied mathematics, and, occasionally, Danish and Polish. In the first three combinations German may take the place of any one subject. The requirements in any of the subjects mentioned, except Hebrew, are divided into two stages: the second grade covers the lower and middle classes including untersecunda (minor subjects); the other, the first, includes also the upper classes (major). A candidate is successful when he satisfies in the general examination, and passes in at least one major (first grade, *Lehrbefähigung für die erste Stufe*) and two minor subjects. A large number of subjects may, however, be selected by the candidate, as, for instance, two major and one or two minors. The examination is conducted as follows: The candidate must in the written examination prepare privately two essays, one for the general and the other for the special examination. The wishes of the candidates are considered so far as possible. Sixteen weeks are allowed for the preparation of these essays, although an extension of sixteen more weeks may easily be obtained. A doctor's dissertation or some other printed work may be accepted in place of one of the two essays. A further written test of at most three hours' duration may be imposed, and is in any case required in modern languages. This is followed by the oral examination which lasts about an hour for each major subject and half an hour for each minor, although these periods are nowhere prescribed definitely. Reëxamination, extension and supplementary examinations are permitted, but not more than twice for each one of these.

The following requirements of the Prussian Examination Ordinance in a few important subjects are added to indicate the scope of knowledge expected: —

Latin and Greek. — (*a*) Second grade. A sound knowledge of Greek and Latin grammar; ability in the written use of both languages so far as to translate suitable passages with grammatical correctness and, in Latin at any rate, without any striking defects of style; ability, on the basis of systematic and thorough reading of the classics, to understand, and, omitting passages of special difficulty, to translate readily, selections from works suitable for Sekunda in the gymnasium. Candidates must possess such a knowledge of Greek and Roman history, including the history of literature and antiquities, mythology and prosody, as to give the necessary explanation on these points of authors to be read in the middle stage, and to be able to employ intelligently good reference works in the preparation of lessons.

For the first grade the additional requirements are a thorough scientific knowledge of grammar; readiness in the written use of Latin, grammatical correctness in the written use of Greek, and ability to speak Latin; wide reading knowledge of the Greek and Roman classics, especially such as serve to enrich the lessons in the gymnasium, and scientific training in the method of explanations; acquaintance with prosody, so far as it bears on the poets to be read in the gymnasium, and practice in appropriate rendering of verse; a knowledge of the general literary development, particularly the best periods; sufficient acquaintance to guarantee further systematic study of the principal periods in Greek and Roman history, political institutions, private life, religion and mythology, and philosophy of the Greeks and Romans; a knowledge of archæology so far as necessary for effective illustration of lessons by intelligent employment of an appropriate selection of objects. The candidates must also give evidence of a knowledge in outline of the development of philology.

English. — After giving evidence of a knowledge of elementary Latin grammar and ability to understand and to translate at least easy passages in the school authors, such as Cæsar, the requirements in this subject are (*a*) for the second grade: A knowledge of the elements of phonetics; correctness and thorough familiarity in pronunciation; a knowledge of accidence and syntax, and elementary synonymik; the possession of a broad vocabulary and knowledge of idiom, and some ability in oral use of the language; a knowledge in outline of the development from the time of Shakespeare of English literature, in which the works of the most important writers in prose and verse must be read; readiness in correct translation of the usual authors into German and in free, written composition in the foreign language without serious errors of expression and style. (The requirements in French are very similar.)

(*b*) For the first grade: In the written and oral use of the language there is expected not only complete grammatical correctness based on a scientific study of grammar, but a thorough acquaintance with the vocabulary and the peculiarities of idiom, together with a satisfactory ability to employ them for purposes of instruction; a knowledge in outline of the development of the language from the Old English period, and the general development of literature together with a detailed study of the more important works in the past and present; familiarity with the rules of English prosody in the early and modern periods; acquaintance with the history of England so far as necessary for the material explanation of the common school authors. Where the knowledge of the historical development of the language is not so detailed a very able and thorough knowledge of modern literature and an excellent command of the modern language may be accepted as an equivalent.

Pure Mathematics. — (*a*) For the second grade: A sound knowledge of elementary mathematics and acquaintance with analytical plane geometry, especially with the chief qualities of conic sections and the principles of differential and integral calculus. (*b*) For the first grade: Such a familiarity with the principles of higher geometry, arithmetic, algebra, higher analysis, and analytical mechanics, that the candidate can solve a not too difficult problem out of this field.

Physics. — (*a*) For the second grade: A knowledge of the more important principles and laws out of the whole field of this science, and ability to prove these laws mathematically, so far as possible without the application of higher mathematics; an acquaintance with the instruments necessary for school instruction and practice in using them. (*b*) For the first grade: A more detailed knowledge of experimental physics, and its applications; acquaintance with the fundamental investigations in one of the more important branches of theoretical physics, and a general view of the whole field.

The requirements described are those of Prussia, and they are similar in other states with noteworthy differences in Bavaria and Württemberg. In both these countries every candidate has to pass two examinations at an interval of two or more years, and the preparatory work to be done at the university is more strictly prescribed, while the oral and written examinations are conducted differently (see Morsch). Only the following states have agreed to mutually recognize their respective examination certificates; Prussia, Saxony, and the smaller Saxon states, Mecklenburg-Schwerin, Brunswick, Alsace-Lorraine, and some of the smallest states which have no examining boards of their own.

Practical Preparation. — The certificate of success in the written examination does not qualify for the appointment of teacher. Such qualification is obtained only by practical training of one, but generally two years. This consists, according to the Prussian regulations, of a Seminar year and a probationary year.

A. The Seminarjahr. — During this year candidates must become acquainted with the theory and principles of education in their application to the higher schools and with the method of individual subjects of instruction, and must be introduced to practical work as teacher and educator. For this purpose they

EDUCATION IN GERMAN STATES

I. ELEMENTARY

	Population in 1905	Central Administrative Authority	Local Administration	Elementary School Attendance	Continuation School	Training of Teachers	Salaries	Pensions
Bavaria	6,524,372	Ministry of the interior for ecclesiastical and educational affairs.	City school committee. Local committee in country.	6–13	Compulsory for three years, 13–16.	2 years normal school; 3 years practice-teacher; 5–6 years assistant.	1200–2130 M.	Teachers contribute.
Württemberg . .	2,302,179	Ministry for ecclesiastical and church affairs; and denominational authorities.	Local school committee (including teachers).	7–14	Compulsory for two years, since 1895.	3 years normal school. No permanent appointment before 24 after a second examination.	1200–2400 M.	Non-contributory; Retire at 65.
Saxony	4,508,608	Ministry for public worship and public instruction.	Committee of city council; in country school committee.	6–14	Compulsory for 3 years for boys, 2 years for girls, since 1873.	3 years normal school.	1500–3000 M.	Non-contributory; Retire at 65.
Baden	2,010,728	Higher school authority in the Ministry for the Interior.	Local council.	6–14 boys. 6–13 or 14 girls.	Compulsory for 2 years for boys, 1 year for girls, since 1875.	3 years normal school; permanent appointment 2–6 years after graduation from n. s. and 2d examination.	1100–2000 M.	Non-contributory; Maximum after 40 years' service.
Hesse	1,209,175	Ministry for the Interior, department for school affairs.	Local school committee, including oldest teachers.	6–14	Compulsory for 3 years for boys only; local option for girls.	3 years normal school; permanent appointment after 2 years and examination.	1100–2800 M.	Non-contributory; Maximum after 50 years' service.
Saxe-Weimar . .	388,095	Department for public worship in state Ministry.	Local school committee, including teachers.	6–14	Compulsory for 2 years for boys; local option for girls.	3 years normal school; permanent appointment after 2 years and examination.	1200–2300 M.	Non-contributory; Maximum after 37 years' service.
Mecklenburg-Schwerin	625,045	Department for educational affairs in the Ministry.	Local school committee; private estate owners.	6–14	Not compulsory; state subsidies industrial education.	2 years normal school.	400–1300 M. (country) 800–2000 M. (cities).	Non-contributory; Maximum after 50 years' service.
Mecklenburg-Strelitz	103,451						900–2500 M.	No provision.
Oldenburg . . .	438,856	Department for churches and schools in the state Ministry.	Local school committee; pastor, a teacher, chief administrative officer, and an elected member.	6–15	Voluntary.	3 years normal school; permanent appointment after 3 years and examination.	1000–1750 M.	Contributory; Maximum after about 37 years' service.
Saxe-Meiningen .	268,916	Department for church and school affairs in state Ministry.	Local school committee (mayor, school principal, three representatives).	6–14	Compulsory for 2 years for boys and girls.	3 years normal school; permanent appointment after 2 years and examination.	1100–2200 M.	Non-contributory; Maximum after 50 years' service.
Saxe-Coburg-Gotha	242,432	Department in the state Ministry.	Local school committee, including the pastor.	6–14	Compulsory for 3 years for boys and girls in Coburg.	3 years normal school; permanent appointment after 2 years and examination.	1100–2500 M.	Non-contributory; Maximum after 40 years' service.
Saxe-Altenburg .	206,508	Department for ecclesiastical affairs in the state Ministry.	Local pastor in country; church superintendent in towns.	6–14	Not compulsory.	3 years normal school.	1150–2250 M.	Non-contributory; Maximum after 40 years' service.

I. ELEMENTARY — *Continued*

	Population in 1905	Central Administrative Authority	Local Administration	Elementary School Attendance	Continuation School	Training of Teachers	Salaries	Pensions
Anhalt	328,029	Department for school affairs in the government.	Local school committee, including a teacher.	6–14 or earlier, if attainments satisfy.	Compulsory.	3 years normal school; permanent appointment after 2 years' examination.	1200–3000 M.	Non-contributory; Maximum after 50 years' service.
Brunswick . . .	485,958	Ministry of education.	Local school committee, including oldest teachers as advisors.	6–14	Compulsory.	3 years normal school; permanent appointment after examination, at 25 years of age.	1000–2100 M.	Non-contributory; Maximum after 50 years' Service
Reuss ä. L. . . .	70,603	Consistory.	Local school committee.	6–14	Not compulsory.	2 years normal school; permanent appointment after examination.	1200–3300 M.	Contributory; Maximum after 37 years' Service
Reuss j. L. . . .	144,584	Department for church and school affairs in the Ministry.	Local school committee (mayor, pastor, 1 teacher and 2 representatives.	6–14	Not compulsory.	3 years normal school; permanent appointment after 2d examination.	1100–2200 M.	As in Reuss ä. L.
Schwarzburg-Rudolstadt	96,835	Department for church and school affairs in the Ministry.	Local school committee with pastor as president.	6–14 boys. 6–13½ girls.	Compulsory.	3 years normal school; permanent appointment after 2d examination.	1000–2000 M.	Non-contributory; Maximum after 50 years' service.
Schwarburg-Sondershausen	85,152	Department for church and school affairs in the Ministry.	Local school committee (mayor, pastor, and 2–4 elected members).	6–14	Compulsory for boys for 2 years.	3 years normal school; permanent appointment after 2d examination.	1050–2450 M.	Non-contributory; Maximum after 40 years' service.
Lippe	145,577	Consistory	Local school committee (pastor, administrative officers and teachers, and elected members).	6–14	Compulsory.	3 years normal school; permanent appointment after 2d examination.	1150–2000 M.	Non-contributory; Maximum after 37 years' service.
Schaumburg-Lippe	44,992	Ministry.	Local school committee (pastor presiding in country, mayor in cities).	6–14		3 years normal school; permanent appointment after 2d examination.	450–2450 M.	Non-contributory; Maximum after 45 years' service.
Waldeck-Pyrmont	59,127	Principality administrative authority for elementary education: the provincial school board at Cassel for secondary.	District school committee (a pastor, administrative officer, schoolman).	6–14	Compulsory for boys for 2 years.	Teachers trained in Prussian normal schools.	1100–2740 M.	Non-contributory; Maximum after 25 years' service.
Lübeck (Free City)	105,857	Superior school authority (members of senate, elected members, schoolmen, clergy).		6–14		3 years normal school.	1600–2500 M.	Non-contributory; Maximum after 35 years' service.
Hamburg (Free City)	874,878	Superior school authority (members of senate, elected members, schoolmen, clergy).	District school committee.	6–14 (English compulsory in some boys' schools).	Optional.	3 years normal school; permanent appointment after four years and examinations.	2000–4400 M.	Non-contributory; Maximum after 40 years' service.
Bremen (Free City)	263,440	Senatorial committee for educational affairs advised by a superintendent and school director.		6–14	Optional.	3 years normal school; permanent appointment after examination after 2–5 years.	1800–3600 M.	Non-contributory; Maximum after 30 years' service.

II. SECONDARY (1908)

	Secondary Schools								Appointment of Teachers	Salaries without Rent-Indemnity: Teachers,–Directors	Pensions (Per Cent of Salary last Received)
	Gymnasium	Realgymnasium	Oberrealschule	Progymnasium	Realprogymnasium	Realschule	Private Schools	Normal Schools			
Prussia	326	103	61	41	48	157	21	165	University; Prüfung für das Lehramt an höheren Schulen; Seminarjahr; Probejahr.	T. 2700–7200 M. D. 6000–7800 M.	Non-contributory; Maximum 75%, after 40 years.
Bavaria	47	5	9	30	—	46	9	12	University; general and professional examinations; Seminarjahr.	T. 3000–6000 M. D. 7200–9600 M.	Non-contributory; Maximum 100%, at the age of 70.
Saxony	19	15	2	—	3	32	6	21	University; general and professional examinations; pedagogical Seminar at Leipsig; Probejahr.	T. 3600–7200 M. D. 6600–9300 M.	Non-contributory; Maximum 80%, after 40 years of service.
Württemberg	18	4	10	6	8	21	2	6	University; general and professional examinations; Probejahr.	T. 3400–5300 M. D. 3900–6300 M.	Contributory 2%; Maximum after 40 years of service.
Baden	18	7	8	—	8	30	1	4	As in Prussia; Probejahr and seminarjahr combined in a university town.	T. 2500–6400 M. D. 3500–7450 M.	Non-contributory; Maximum 75%, after 40 years' service.
Hesse	11	3	7	3	—	13	1	3	Examinations; Seminarjahr in one of six schools; Probejahr.	T. 2800–6000 M. (6000 M. in 6th year). D. 5600–6600 M.	Non-contributory; Maximum 100%, after 50 years' service.
Mecklenburg-Schwerin	7	6	—	—	2	5	—	1	As in Prussia.	3000–7500 M.	Non-contributory; Maximum 90%, after 50 years' service.
Mecklenburg-Strelitz	3	—	—	—	1	2	—	1	As in Prussia.	T. 2500–6000 M. D. 6000–7000 M.	As in Mecklenberg-Schwerin.
Saxe-Weimar	3	2	—	—	1	4	—	2	As in Prussia (Seminarjahr at Jena).	T. 3000–6600 M. D. 5000–7500 M.	Non-contributory; Maximum 80%, after 36 years' service.
Oldenburg	5	—	1	—	—	2	—	2	As in Prussia.	T. 3300–6600 M. D. 5600–7150 M.	Non-contributory; Maximum 90%, after 50 years' service.
Brunswick	6	1	1	2	—	1	4	2	As in Prussia.	T. 2700–6300 M. D. 4800–7000 M.	Non-contributory; Maximum 100%, after 50 years' service.
Saxe-Meiningen	2	2	—	—	—	2	1	1	As in Saxe-Weimar.	T. 2700–5100 M. D. 6000–6300 M.	Non-contributory; Maximum 75%, after 40 years' service.

II. SECONDARY (1908) — *Continued*

	Secondary Schools								Appointment of Teachers	Salaries without Rent-Indemnity: Teachers, Directors	Pensions (Per Cent of Salary last Received)
	Gymnasium	Realgymnasium	Oberrealschule	Progymnasium	Realprogymnasium	Realschule	Private Schools	Normal Schools			
Saxe-Altenburg	2	—	—	—	—	2	1	1	As in Saxe-Weimar.	T. 3000–6500 M. D. 5000–7500 M.	Contributory 3%; Maximum 80%, after 40 years' service.
Saxe-Coburg-Gotha	2	1	1	—	—	2	—	2	As in Prussia.	T. 3000–6000 M. D. -6600 M.	Non-contributory; Maximum 100%, after 50 years' service.
Anhalt	4	1	1	1	1	3	—	1	As in Prussia.	T. 3000–6600 M. D. 5400–7400 M.	Non-contributory; Maximum 100%, after 49 years' service.
Schwarzburg-Rudolstadt . .	1	—	—	—	2	—	1	1		T. 3000–5600 M. D. 4800–6400 M.	Contributory 2%; Maximum 80%, after 36 years' service.
Schwarzburg-Sondershausen .	2	—	—	—	—	2	—	1		T. 3000–6000 M. D. -6500 M.	Contributory 2%; Maximum 80%, after 37 years' service.
Waldeck	1	—	—	—	1	1	1	—	As in Prussia.	T. 2700–6000 M. D. 4800–6900 M.	Non-contributory; Maximum 66⅔%, after 25 years' service.
Reuss ä. L.	1	—	—	—	—	1	—	1		T. 3200–6200 M. D. 5800–7200 M.	Non-contributory; Maximum 80%, after 37 years' service.
Reuss j. L.	2	1	—	—	—	1	1	1		T. 3500–6600 M. D. 6000–7500 M.	As in Reuss ä. L.
Lippe	2	—	—	—	—	2	1	1		T. 2400–5700 M. D. 4500–6600 M.	Non-contributory; Maximum 80%, after 37 years' service.
Schaumburg-Lippe	1	1	—	—	1	—	—	1		T. 2970–6270 M. D. 4950–6930 M.	Non-contributory; Maximum 80%, after 45 years' service.
Lübeck	2	—	—	—	—	2	1	1	As in Prussia.	T. 4000–7500 M. D. 7500–9500 M.	Non-contributory; Maximum 75%, after 35 years' service.
Bremen	3	1	2	—	—	3	—	1	As in Prussia.	T. 4000–7800 M. D. 8000–9000 M.	Non-contributory; Maximum 80%, after 30 years' service.
Hamburg	2	1	3	—	—	8	6	2	As in Prussia.	T. 4000–9000 M. D. 12,000 M.	Non-contributory; Maximum 100%, after 50 years' service.
Alsace-Lorraine	18	2	5	1	—	11	—	1	As in Prussia.	T. 3200–6800 M. D. 5100–7200 M.	Non-contributory; Maximum 75%, after 40 years' service.

are assigned in groups of eight or ten to a school, where at least two hours of discussion take place each week chiefly on the following subjects: principles of education and instruction and method, especially of the subjects of the candidates; historical survey and discussion of contemporary questions, the character, organization, and curriculum of the higher schools; the school ordinance; principles of school discipline, hygiene, etc.; administrative authorities and their organization; service regulations of teachers; and, finally, directions for observation of lessons. The candidates must bring short reports or deliver oral lectures on all these subjects. In their particular work, they must acquire by class-room visitation a survey of the tasks of the whole school. The trial lessons of the candidates begin as soon as possible, and the problems, which at first are kept within narrow limits, are generally made broader and more extensive. Each candidate must give a trial lesson about once in four weeks, at which all the candidates, the director, and the subject teacher must be present. This is followed by a general discussion and criticism. About two months before the close of the year every candidate must hand in a somewhat larger dissertation which demands theoretical considerations and practical applications and should be based on the candidate's own experience and observation.

B. The Probationary Year (*Probejahr*). — This period serves mainly to afford the candidates practice in the application of the educational knowledge and ability acquired in the seminar-year, and is usually spent in another institution. The candidates are intrusted with larger, more continuous problems for eight or ten hours a week, always under the more or less strict supervision of the director and those teachers in whose classes the candidates are teaching. As evidence of the amount of pedagogical insight attained the candidates must hand in a report of their own work as teachers. It is only then that the certificate qualifying for appointment in a higher school can be granted, and with it ends the training of the young teacher.

Reform in the Higher Schools. — Only the most important of the reform movements and ideas can be mentioned here without any further discussion. The following are movements which have been realized here and there without any general acceptance as yet: the introduction of boarding schools; the admission of girls to boys' higher schools: the introduction of biology, philosophy, and civics; closer attention to the modern scientific theology in religious instructions; and, above all, greater freedom and consideration of the interests of the pupils in the upper stage. Possibly there should also be added here the frequent demand for more professorships of education. The following opinions, which have remained nothing more and of which one or the other may be realized in the future, may be referred to: lessening of the home work and the number of subjects in the curriculum; establishment of vocational classes; special promotion of pupils of more than average ability; separation of the upper stage and the establishment of an intermediate institution between the school and the university, somewhat like the American college; and a number of other radical ideas which cannot be mentioned here. It is a pretty generally accepted opinion that the German higher school system, as at present organized, cannot last any length of time; but how it is to be reformed is a problem. But those concerned in it are convinced that reform will not be brought about by a revolution, but by gradual, even slow, but unceasing development. P. Z.

UNIVERSITIES. — **Historical.** — (I) Although the German universities are considerably younger than the famous *Studia generalia* of Italy, France, England, and Spain, Germany from the beginning played an important part in medieval culture. At Bologna and Paris German students and teachers made very creditable contribution to the universities, and in Germany itself schools of the orders like the Dominicans and Franciscans at Cologne, where men like Albertus Magnus, Thomas Aquinas, and Duns Scotus taught, were close rivals of the foreign universities. But the universities proper only sprang up in Germany in the middle or, if the whole of present Germany is considered, towards the end of the century.

In order of time two groups may be distinguished: (1) 1349–1415. Prague 1349, Vienna 1365, Heidelberg 1385, Cologne 1388, Erfurt 1392, Leipzig 1409, Rostock 1419. By the establishment of a *studium generale* at these places the educational organization of Southern and Western Europe was transplanted into German territory. (2) 1456–1506. Greifswald 1456, Freiburg 1457, Basle 1459, Ingolstadt 1472, Trier 1473, Mainz 1477, Tübingen 1504, Wittenberg 1504, Frankfort-on-the-Oder 1506 (*q.v.*). The establishment of these institutions was a natural consequence of the new intellectual movement of the time, the Renaissance, but a greater cause was the concentration of political power in the hands of territorial princes. To strengthen their influence these rulers confined the clerical and intellectual life within their own borders and found need for their own territorial university. All these universities, including the older, did not originate independently as did Paris out of the association of famous teachers and their students, but definite political aims contributed to the rise of each. Hence the life of the students was not regulated by a democratic constitution similar to that at Bologna, but the statutes were imposed from above, generally modeled on those which had in the meantime been developed in Paris. However much the secular power may have done for the establishment, granting of privileges and organization of a university, in its whole work and character it was regarded entirely as an ecclesiastical and clerical institution. Not only did the faculties receive the right to teach and grant academic honors through the papal bull, but in its general attitude and sympathy the university belonged to the clerical estate. The success and influence of these numerous universities on the culture of Germany, in spite of the ridicule of the humanists and the charges of the Reformers, were both very great. Neither movement would have been possible without the preparatory work of scholasticism fostered by the universities. According to Eulenberg's investigations about the year 1500 there were from three to four thousand natives and some two thousand foreign students in Germany. How great must even then have been the number in the German population of university-trained men!

(II) At the beginning of the sixteenth century scholasticism was driven out in Germany as elsewhere by the humanistic movement. But just as the triumph of humanism seemed about to be completed, a new and stronger movement, the Reformation, began and destroyed almost entirely the hopes of victory. Since all intellectual activity had until then been clerical, the general attack on clericalism was bound to lead to a vast upheaval of the whole educational system. But the confusion was soon overcome, for in the first place the German Reformers required for the success of their work a far better educated clergy than the old church; to be able to preach the " pure word of God," the pastor must have studied. Secondly, the secular powers also needed a thoroughly well-trained legal profession for the new duties which were thrust on them by the increase of territorial rights, confiscation of church property, and the acceptance of Roman law. Under pressure of these needs the crisis was overcome and the universities in Germany became territorial institutions for the purpose of meeting the demand for theologians and lawyers. The deeper the cleavage between the Catholic and Evangelical (including Lutheran and Reformed) churches became, the more rigorously was the territorial principle applied to the universities. New universities were added in great numbers; Protestant were Marburg (1527), Königsberg (1544), Jena (1558), and Helmstedt (1576); Catholic included the two Jesuit universities of Dillingen (1549) and Würzburg (1582) (*qq.v.*). The older universities were also reorganized to meet the new requirements. The smaller principalities and free towns added to their gymnasiums a course of academic lectures, for such an " academic gymnasium " enabled the poorer states to train up theologians and jurists above suspicion from among their own sons. While in the medieval period the majority of the students had been content with a training in the fourth and lowest faculty, arts, they now sought a professional training in law and theology, with the result that the numbers in these superior faculties increased. Medicine and science still remained almost insignificant. Instruction in all the faculties had taken over from humanism the watchword " Back to the sources," a worship above all of the three sacred tongues, and for daily use a number of new textbooks, but in practice there continued, even in Protestant Germany, the characteristic forms of scholastic method throughout the whole of this period. The intellectual standard of the universities rose somewhat during this period as compared with the earlier, but hardly at the same rate as the general intellectual progress. The epoch-making science of the day, the mathematical, was excluded from the universities, and the contributions of Copernicus, Galileo, Kepler, Descartes, Newton, Leibnitz, were made outside of these institutions. Exhausted as they were by the devastation of the Thirty Years' War (1618–1648), the universities were not in a position to continue their progress.

(III) Research in modern science, which in France, England, and Italy was promoted by academies or societies, in Germany gradually began to center round the universities. Leibnitz, it is true, had already in 1700 called into existence at the Royal Court in Berlin an academy modeled on the Académie des Sciences in Paris, and the Royal Society in London, followed in 1757 by the establishment of the Gesellschaft der Wissenschaften at Göttingen in the Kingdom of Hanover. But the intellectual modernization of culture in Germany did not proceed from the associations of investigators, but from the professorial chairs. Hence the academies in Germany are up to the present but of secondary importance and consist of associations of university professors meeting for definite and specialized research.

The new era was opened by the establishment of the Prussian University of Halle in 1694 as a conscious protest against the traditional studies. The modern movement was there inaugurated by three professors: (1) The pietist, August Hermann Francke (*q.v.*), who broke through the prevailing theological orthodoxy; (2) the leader in the enlightenment, Christian Thomasius (*q.v.*), who swept out of existence the prevailing formalistic prejudices and superstitions in political and ecclesiastical law; (3) the rationalist, Christian Wolff, who tore down the scholastic barriers between philosophy, mathematics, and natural science. The modern principle of academic freedom now begins its triumphant course. Instruction is now marked by the lecture method with which is introduced the use of the vernacular. While French culture above all had exercised a profound influence on Prussia, the University of Göttingen, founded in 1737, was influenced by the connection between the kingdom of

Hanover and England. Göttingen took Halle as a model, and in addition to jurisprudence promoted the study of the natural sciences and introduced the modern study of the classics; not the mere imitation of ancient models in poetry and eloquence, but a complete entering into the spirit of classical antiquity from the literary, historical, and æsthetic standpoints. Halle and Göttingen were followed in 1743 by the foundation of Erlangen. At the end of the eighteenth century the new ideas had become firmly established in the German universities.

(IV) At the time that Napoleon reorganized the French universities on the principle of the strictest possible control of academic learning and teaching (1808), Prussia, conquered and deprived of all power, established the University of Berlin (1810) on the widely different basis of the greatest academic freedom. Intellectual power was to replace what Prussia had lost materially, and the training in pure idealism was to be left entirely to the influence of truth and freedom. While the universities had hitherto been conducted like schools, with the professors as masters and the students as apprentices, the University of Berlin was to be a free intellectual working community with the professors as masters and the students as their assistants, both occupied in common with the solution of the same tasks. This principle soon found its way into all German universities and laid the foundations on which was built up Germany's unique position in international culture. Soon after Berlin, Breslau (1811), Bonn (1818), and Munich (1826) were founded. A number of the older and smaller universities had disappeared in the Napoleonic period. No new foundations were made in the nineteenth century in spite of the great increase in population. It is only within recent years that it has been proposed to add to the existing number of universities. In 1902 Münster was transformed from an Academy for Catholic Theologians into a university. Recently it has been agitated to establish universities on a basis of voluntary endowments and municipal grants, and in 1914 such an institution will be opened at Frankfort-a.-M. (*q.v.*), while another is proposed in Hamburg. Hitherto it has been unnecessary to increase the number of universities, since in their inherent organization the existing institutions have been much extended and have become specialized. The two great tendencies of the nineteenth century, the great specialization in the intellectual work especially and the remarkable development of natural science, led to a demand not only for a great increase of instructors and a narrow specialization of studies, but also for a development and a constant increase of all the numerous intellectual institutions connected with a university. Since the chief aim of university instruction is to make men of the students, not only imbued with the spirit of their subject, but ready to carry it forward step by step, the German university requires in the first place learned seminars and scientific laboratories. In the philosophic-historical subjects, in theology, jurisprudence, philology, etc., the seminars, in which the master and his assistants investigate the problems in their field, necessarily required in the course of the nineteenth century more complete equipment, while in medicine and the natural sciences more suitable and more specialized clinics, laboratories, and experimental institutes had constantly to be provided. Since the expenditure on the institutes is much greater in the larger than the smaller universities, a certain amount of inequality arose among them, only compensated for by the fact that the student is enabled to be more directly and personally associated with his director in the smaller than in the larger institutes. As far as the quality of professors is concerned there is no distinction at the different universities. It may be that a few places have one or two men of repute or even geniuses among their professors, but Germany is thus distinguished from other countries by the fact that in essence all the universities are alike, and the same may be studied in Freiburg or in Königsberg as in Berlin.

Present Position. — *Relation to the State.* — Universities may be established only by the state or with the approval of the state. All the existing universities are state institutions, and as such juristic persons in public law. Their rights, however, as a result of the federal character of the German Empire vary somewhat. As a rule they are not based on legislation but on special privileges, statutes, and ministerial decrees. The income of the universities is very slight, and only a few have sufficient interest-bearing property to be able to cover an appreciable portion of their maintenance at their own expense. Generally they are maintained by the state. The state university budget must, like the state budget, generally receive the approval of the regular representative bodies, and at the discussions the public can, through its representatives, make its wishes with reference to the universities felt. The states do not allow any one to hold an appointment in the church, in the judiciary or higher administrative service, and permit no one to practice law or medicine who has not studied in a German university and then passed the prescribed state examinations. These state privileges are more important for the universities at present than the right to grant academic degrees. The authority in Prussia to which the universities are subjected is the Ministry of Public Worship and Education, which appoints a representative, Curator, or Chancellor for each university, with charge of the external affairs.

The internal administration is in the hands of the universities themselves through the Rector and Senate. The Senate consists either

Distribution of Expenditures in Percentage of the total, in Prussian Universities. (*Preuss. Statistik*, Vol. 223, p. 7.)

	1868	1877-1878	1887-1888	1896-1897	1905-1906	1908-1909
Cost of administration . .	5.67	37.0	3.46	4.49	4.11	3.94
Salary of professors, etc. .	45.95	41.94	36.00	30.49	27.93	27.85
Institutes, collections, etc.	37.07	47.18	47.18	51.96	55.45	56.04
Hostels, maintenance, grants, etc. .	3.70	2.30	1.66	1.67	1.30	1.10
Cost of building rates taxes . . .	3.19	2.45	3.61	3.73	4.17	4.20
Covering of decreases in receipts unforeseen and surplus expenditure . .	4.42	3.03	2.71	2.54	2.27	2.27
Rent indemnities for instructors . .		6.02	5.38	5.12	4.77	4.52

of several full professors (*ordentliche Professoren*) or generally of annually changing committees of the same body. The Rector or, in some states where the hereditary ruler holds this position, the Prorector is elected annually from the ranks of the full professors, and his election must receive the approval of the state. He presides over the senate. The professors are civil servants with certain privileges. Full professors are appointed by the state or the ruling prince on the responsibility of the Ministry, when as a rule the suggestions of the Faculty or the university are respected. The state also appoints associate professors (*ausserordentliche Professoren*) and confers the professorial] title. Again the universities are represented in the legislature of the state by each sending one professor *ex officio* to the Diet (upper House) of their respective state.

Relation to the Church. — This in Germany is in some ways simpler, in some more complicated, than elsewhere. It is simpler in that both university and church are under the same authority, both being state institutions. Other denominations than the evangelical or Roman Catholic are of little significance, since their membership is too small. But it is this very close connection between Church and State that leads to great complication. The Catholic Church is opposed to the fundamental principle of the German universities, absolute academic freedom, while a strong section in the evangelical church is at any rate not friendly to it. This in view of the strength of the Catholic party in politics leads to parliamentary conflicts on the question of intellectual prescription and on the so-called destructive activity of the " atheistic " professors. So far as individual theological faculties are concerned, the opponents of academic freedom in the evangelical church seek the coöperation of the local synods in filling theological chairs. Hitherto the state authorities have opposed these tendencies. Yet in practice some concession was made to them in filling chairs not in accordance with the qualifications of candidates and the suggestions of the university, but on the basis of distributive justice (*justitia distributiva*) between the right and left wings of the clerical political parties, with the result that science invariably suffered. In the Catholic theological faculties the present modernist movement has caused the state authorities considerable difficulties; what, for instance, should be the attitude of the state when a professor of theology, appointed by the state with a guarantee of academic freedom, refuses to accept the prescription of his church in his teaching? or again, when a university receives into its midst professors who have taken this oath and thus have abjured their freedom? A solution of this situation has not yet been discovered. The following Prussian universities have evangelical theological faculties: Berlin, Bonn, Breslau, Greifswald, Halle, Königsberg (all for the old Prussian state church), Göttingen (for the state church in the Prussian province of Hanover), Marburg (for the state church in the province of Hesse-Nassau), and Kiel (for the state church in the province of Schleswig-Holstein). Besides there are evangelical theological faculties at Erlangen (Bavaria), Leipzig (Saxony), Tübingen (Württemberg), Heidelberg (Baden), Giessen (Hesse), Rostock (Mecklenburg), Jena (Thuringian States), Strassburg (Alsace-Lorraine). Catholic theological faculties exist in Prussia at Bonn, Breslau, and Münster; in Bavaria at Munich and Würzburg; in Württemberg at Tübingen; in Baden at Freiburg; in Alsace-Lorraine at Strassburg. These university faculties, however, do not suffice for the demand for the Catholic clergy in Germany, and there are in addition six state Lyceums (five in Bavaria and one in Prussia) in which the professors are appointed by the state, one espicopal Lyceum in Bavaria, and seven episcopal theological institutions (six in Prussia and one in Lorraine) in which the professors are appointed by the bishops. Athough several universities retain their denominational title from their origin, *e.g.* the Evangelical University of Halle, they are in fact wholly undenominational. Jews are admitted to the teaching bodies everywhere in a percentage far above their number in the population. However, the complaints of the Jews that they are overlooked for promotions are not rare and frequently not without reason.

Organization. — The universities are still organized according to tradition into four faculties. No university has less than four faculties, only the recently founded University of Münster is still without a medical faculty. In single instances only is there a faculty of political science as distinct from that of law, and a mathematical-natural-science as distinct from the philosophical. In a broader sense the faculties include the whole *corpus academicum*, the teaching body as well as the students. In the narrower sense the faculty consists only of a section of the teaching body, the full professors in the respective faculty. These elect annually from their midst a dean as director of their business. They are responsible for the regular conduct of instruction in their field, suggest names to the Minister in filling vacant chairs, for the distribution of definite courses to other instructors, for the promotion of private docents (*q.v.*) and associate professors, etc. They further arrange the schedule of lectures and arrange the hours among themselves, determine on the admission of private docents, and are the authority responsible for the conferment of academic degrees.

The full professors (*ordentliche Professoren, ordinarii*) are almost the sole and exclusive bearers of all the rights of the academic teaching bodies. Each of them has a teaching commission for a definite subject and is as a rule bound to conduct a more comprehensive private course in his field and one free public lecture of one or two hours. He receives, first, a definite salary, as a rule 4000–6000 M. ($800–1200) a year, and a slight indemnity for rent; secondly, the fees paid by the students for the private courses, usually 5 M. an hour each semester (although in Prussia when fees exceed 3000 M., half of the excess must be paid into the treasury); thirdly, increments granted at the discretion of the Minister who wields a great power; fourthly, fees for graduation and examinations. Professors of medicine conduct to some extent their private practice, and as compared with the great income from this source their salary is insignificant. Similarly, professors in other applied sciences frequently have considerable additions to their salaries.

In addition to the full professors there are a number of others: (1) Honorary full professors who have the rank of full professors but nothing more; (2) titular professors or private docents who have only the title of professor but nothing more. (3) Associate professors (*ausserordentliche Professoren, extraordinarii*) are divided into two classes according as their salaries are or are not permanently included in the university budget. The latter receive no salary, though they often receive a remuneration, as when they are assigned to give a definite course. Such assignments are also made occasionally to private docents. The deciding question in this confusion of titles and positions is whether an instructor is provided for in the budget, for although he does not as a consequence receive a seat or a voice in the faculty, yet his teaching is recognized as within the university. Of greater importance, however, in the applied sciences is it that he conduct his own institute, and is thus independent of other professors. In the case of private docents it is to some extent a limitation of this academic freedom that they are dependent on the good will of full professors for the use of equipment in the applied sciences. The number of associate or extraordinary professors is very large, since with the constant specialization in all sciences and the comparatively slow increase of full professorships the work of the university could certainly not be carried on. The salary of an associate professor who is paid by the state rises in Prussia from 2000 M. to 4000 M. in twenty years. Many professors never rise above the grade of associate professor because there is no full professorship at all in their subject.

The ranks of the professors are as a rule filled from among the private docents. (See Docent for method of appointment, etc.) It is the exception for a man to be called from practical work as pastor, judge, doctor to fill a chair, but in some faculties is not quite so rare an occurrence.

A number of young scientists are also employed to assist the professors. Frequently in the applied sciences a private docent is also appointed as assistant; in such cases his dependence on the full professor is thus correspondingly greater.

Student Body. — The requirement for matriculation as student in a German university is the possession of the maturity certificate (*Reifezeugnis*) of a secondary school (*Gym-*

NUMBER OF INSTRUCTORS IN THE GERMAN UNIVERSITIES

(*Preuss. Statistik*, Vol. 223, p. 26)

a. Full Professors. *b.* Associate Professors. *c.* Private Docents.

	Evangelical Theology			Catholic Theology			Law			Medicine			Philosophy			Total		
Winter Semester	*a*	*b*	*c*	*a*	*b*	*c*	*a*	*b*	*c*	*a*	*b*	*c*	*a*	*b*	*c*	*a*	*b*	*c*
1896–7	101	22[1] +5	27	51	7 +1	6	143	25 +5	35	198	163 +5	223	521	242 +34	280	1015	459 +50	571
1896–7	109	32 +5	31	55	11 +2	5	155	26 +12	40	215	213 +11	289	556	293 +46	388	1090	575 +76	753
1908–9	119	41 +5	34	63	16 +5	19	164	51 +17	47	251	260 +34	497	650	403 +60	511	1247	771 +121	1108

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[1] The addition refers in every case to Honorary Professors.

nasium, *Realgymnasium*, or *Oberrealschule*). The certificate of certain professional schools is also accepted in some universities for further study in the special subjects; thus, the graduates of industrial schools are under certain circumstances permitted to take up the study of mathematics and natural science, or graduates of normal schools for elementary teachers may be admitted for the study of pedagogy, *e.g.* at Leipzig, Jena, Giessen, and Tübingen. Women who have fulfilled the same requirements as men are also matriculated, although there are individual professors who do not admit women to their classes. Foreigners are admitted everywhere, if they can show satisfactory preparation. Besides the students there are further registered auditors (*Hörer*). At Giessen permission to visit is granted by the Curator for four semesters, which may be extended to six. Such registration is only allowed in the faculty of philosophy. Almost universally the students enjoy complete freedom of study (*Lernfreiheit*), but since the regulations for the professional examinations, which are taken at the close of the academic career, prescribe a definite course, the students in most subjects, and especially law, are confined to a more or less regulated curriculum.

The enrollment in the summer semester of 1911 was 57,330 distributed as follows: Evangelical theology, 1834; Catholic theology, 2825; law, 11,023; medicine, 11,927; philosophy, 29,721. These figures include 2522 women. In addition there were 4060 auditors. The students were distributed as follows in the individual universities: Berlin, 6039; Munich, 6942; Leipzig, 4888; Bonn, 4174; Freiburg, 3080; Halle, 2681; Breslau, 2586; Göttingen, 2492; Heidelberg, 2452; Marburg, 2302; Tübingen, 2118; Strassburg, 2071; Münster, 2009; Kiel, 2001; Jena, 1902; Königsberg, 1517; Würzburg, 1449; Giessen, 1315; Greifswald; 1180; Erlangen, 1104; Rostock, 920. (See also COLLEGE AND UNIVERSITY STUDENT ATTENDANCE.)

NUMBER OF STUDENTS COMPARED WITH THE EXPENDITURE OF THE PRUSSIAN UNIVERSITIES

(*Preuss. Statistik*, Vol. 223, p. 7)

	NO. OF STUDENTS	TOTAL EXPENDITURE[1]	EXPENDITURE PER HEAD PER STUDENT
		M.	M.
1868–1869 . . .	7338	3,886,633	530
1877–1878 . . .	8510	7,007,647	823
1887–1888 . . .	13,720	9,180,603	669
1896–1897 . . .	13,864	11,417,345	824
1905–1906 . . .	20,255	15,426,684	762
1908–1909 . . .	22,747	17,428,242	766

The students are partly organized in free societies (*Corporationen*), partly unorganized. The method by which the student organizations among themselves or for the whole student body form committees for the supervision of student interests varies from place to place. The German student does not live in college or similar hostels, but in private houses. Hostels exist only for Catholic theological students, and at Tübingen also for a number of evangelical students. Elsewhere there are small endowments for students of small means. Fees and dues are low. University life only becomes expensive when the student, only just out of school and entering on independence but with high spirits and small financial experience, adopts an expensive mode of life. Extravagance, however, is foreign to the German student or is confined to a small circle, as at Bonn and Heidelberg. But generally the men lead a steady life and work with a will, despite their great freedom.

The period of attendance at the university varies with the different faculties. The following are the number of semesters spent on the average in the last decade: Evangelical theology, 7.37; Catholic theology, 7.04; law, 6.86; medicine, 11.00; philology and history, 9.10; mathematics and natural science, 8.88. The academic degree which prevails in the legal, medical, and philosophical faculties is still only the Doctorate (Dr. Jur.; Dr. Med.; Dr. Phil.). In the theological faculty there are two degrees, the licentiate and the doctorate (Lic. Theol. and D. Theol.). All these degrees are of practical significance only to those who look to an academic career; otherwise they are merely ornamental. They may be obtained in course by the presentation of an independent work of scientific value and an oral examination before the faculty, or they are conferred *honoris causa*. The doctorate in theology is now only conferred as an honorary degree. The technical term for graduation is *Promotion*. Modeled on the university degrees is the title of Doctor of Engineering (Dr. Ing.), conferred by the technical high schools.

In addition to the universities there is an appreciable number of technical high schools, commercial academies and high schools, academies of forestry and mining, veterinary and agricultural high school. To these must be added the military school, such as the war academy, artillery and engineering schools. More intimately connected with the universities, in aiming not at professional education, but at intellectual advancement, are the public lecture courses at the institutions at Frankfort-a.-M. (*q.v.*), Cologne, and Hamburg, the Royal Academy at Posen, and the Berlin Academy for Medical Training for the Army, equivalent to a medical faculty. In university extension work significant beginnings have been made in Berlin (Humboldt Academy, Free High School, Society for Popular Courses by Berlin

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[1] Covered in the main by the state fund, partly from the property of the university. In Prussia, two thirds in 1868, and in 1908–1909 three quarters of the expenditures were borne by the state. The expenditures of the non-Prussian universities are as high as those of Prussia.

University Instructors), at Dresden (*Gehestiftung*), and at Frankfort-a.-M.

LEARNED SOCIETIES. — The societies and associations for the advancement of learning are divided into two classes: the academic or royal societies subsidized by the state, and the general associations founded privately to promote some branch of study. Such associations vary in the character of their work and contributions from the small local society of amateurs and public school teachers to the academic society consisting of carefully trained specialists. It is calculated roughly that there are about one thousand associations founded for purposes of promoting studies throughout Germany. None of these attempt any instruction beyond the reading, discussion, and circulation of reports among members. Some offer prizes for works of original research on a prescribed theme; others for works on any topic; others again subsidize the carrying out of some piece of research. It is impossible here to do more than to mention the state endowed academies.

The earliest German academy is the *Kaiserlich Leopoldinisch-Karolinische deutsche Akademie der Naturforscher* founded in 1662 as the *Academia naturæ curiosorum*, which was at first devoted to the study of the medical sciences and now covers the sciences generally. The academy has no permanent location, except for its library in Dresden, and its seat changes with the home of the president for the time being. The *Königliche Akademie der Wissenschaften* was established in Berlin in 1700 by Frederick I on the suggestion of Leibnitz, its first president. It was reorganized after a period of decline in 1744 and opened with great ceremony by Frederick the Great (*q.v.*). The fields of knowledge which are covered by the academy are mathematics, physics, philosophy, and history-philology. The members are divided into ordinary, foreign, honorary, and corresponding. Transactions and proceedings are published. To the credit of this academy fall the publications of the *Corpus Inscriptionum Græcarum*, *Corpus Inscriptionum Latinarum*, *Corpus Inscriptionum Atticarum*, the works of Aristotle, and the *Monumenta Germaniæ Historica*, all works which can be better undertaken by an institution having some continuity than by an individual. The *Königliche Gesellschaft der Wissenschaften* was established at Göttingen in 1751 and reorganized in 1893. It consists of two classes, — mathematical-physical and philological-historical. At Munich there was founded in 1759 the *Königliche Bayerische Akademie der Wissenschaften* which devotes itself to mathematical-physical, philosophical, and historical studies, although originally founded for the last only. The *Königliche Sächsische Gesellschaft der Wissenschaften* at Leipzig was established in 1846 and incorporated with itself the *Fürstlich Jablonowskische Gesellschaft der Wissenschaften* (founded in 1768) for the study of mathematical-physical and historical-philological subjects. There are further the academies which arise out of the connection in modern times between the arts and sciences, *e.g.* the Academy at Heidelberg (f. 1909), and the Kaiser-Wilhelm Academy in Berlin (f. 1910). F. M. S.

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GERMANY, EDUCATION IN THE COLONIES OF. — The colonial possessions of Germany by their position and natural conditions of soil and climate represent strategic rather than commercial value, and the Home Government has no motive for educational efforts in any part of these possessions, comparable, as regards scope and system, to those maintained by the British, or even by the French governments in their foreign dependencies.

Beginning with Togoland on the slave coast of Upper Guinea, the German colonies comprise a succession of "spheres of influence" bordering on the ocean-washed coasts of West, Southwest, and Eastern Africa, together with groups of small islands in the Pacific Ocean, and the port town and district of Kiau-Chau in the Shantung province of China. With the exception of the last named, the conditions of German occupation are practically the same in all the colonies. At the seat of government reside the imperial governor and his staff, military posts and courts of justice mark the principal places, and at these points center the schools, government and missionary. These are all educational influences as well as direct incentives to progress. Native interpreters are needed for the governor's service, natives are trained for the military and police corps, and are subject to criminal processes in the courts, and native teachers are employed in the schools. Thus individuals selected from the mass of rude tribal peoples become familiar, in some slight measure, with the institutions of orderly society. In the East African colonies the German government encounters strong Mohammedan forces, and consequently formal education becomes a matter of serious importance. An effort has here been made to establish compulsory school attendance in restricted measure.

It was undoubtedly the impulse of commercial rivalry that prompted the colonial enterprises in which Germany engaged in the last quarter of the nineteenth century; but neither Africa nor the Pacific islands have so far yielded large returns for business energy or capital. Meanwhile the military advantage of these possessions has become more and more evident. Science has also been brought to the aid of adventure in efforts for utilizing the natural resources of these lands, constructing roads, and supplying commercial facilities; these late efforts are giving industrial aim to the schools that have been established under German influences. The following statistics and context summarize the main particulars relative to the educational work in the several colonies.

SCHOOL STATISTICS. AFRICAN POSSESSIONS

Colony	Population			Government Schools		Mission Schools	
	Date	*White*	*Native*	*No.*	*No. of Pupils*	*No*	*No. of Pupils*
Togoland . .	1909	330	1,000,000	2	275	150	9057
Kamerun . .	1909	1127	3,000,000	4	2200	—	19,000
German Southwest Africa	1909	13,791	178,000	11	377	—	3000
German East Africa . .	1909	3387	1,000,000	—	3821	—	16,500

The German possessions in the Pacific Ocean comprise two groups of islands: to the first group belong, German New Guinea including Kaiser Wilhelm's Land, Bismarck Archipelago and the small adjacent islands, Caroline, Pelew Marianne, Solomon, and Marshall; the second is the Samoan group including Savaii and Upolu. The estimated native population of the two groups is about 450,000; the non-native colored population, mostly Chinese, numbers about 2000, the white population, chiefly German, about 950. Missionary societies, both Protestant and Roman Catholic, are active on all the islands. The Samoan group was formerly, under the joint protectorate of Great Britain, the United States, and Germany, but was ceded entirely to the latter power by the Anglo-German agreement of Nov. 14, 1899, ratified the following year by the United States. As a result of the prolonged relation with Western Powers, the natives of these islands have been Christianized and are very receptive subjects of missionary instruction. A German government school with about 90 pupils is maintained on the island of Upolu, and in 1909 nearly 9000 pupils were under instruction in missionary schools of the two Samoan islands.

The seizure of Kiau-Chau by Germany in 1897, and the subsequent transfer of the town, harbor, and district to that Power by treaty, were events of great importance in the movement which is gradually transforming the Orient. The entire area of the German Protectorate is 200 square miles exclusive of the bay, which is also about 200 square miles in extent. The civil organization, established before the German arrival, comprises 33 townships. The native population of Kiau-Chau is estimated at 120,000, and the European at about 1200, of whom 1000 are Germans. This number does not include soldiers. At Tsingtau the government has established a college for which elaborate plans have been formed. Two departments are provided for, namely, a preparatory school and a school of science. The preparatory school course extends over six years, taking young Chinese of at least thirteen years of age. These students must have had a good Chinese education and be qualified for the lower classes of high schools. A certificate relative to his qualifications must be submitted by the scholar seeking admittance, obtained after examination, which is indispensable, before the Chinese examiner at Tsinan and the inspector of studies of the college at Tsingtau. Knowledge of the German language and modern sciences is not required for the preparatory school, but if newly entering scholars have such knowledge, they will be admitted to the higher classes. An examination is held before graduation from the preparatory school, which must be passed in order to obtain admission into the higher — second department.

The school of science consists of two divisions: (1) A department of law and political science; and (2) a technical department, including natural history. The program of the first department comprises international law; general state and administrative rights; state laws; railway, mining, and maritime law; political economy; finances and comparative cases of real property. The general outlines of a process or suit and the features of police administration are also included in the course.

In the technical department there are laboratories for chemistry, physics, electricity, mineralogy, and geology, machine building, mining, etc. Students of the higher college are at liberty to choose their vocations, but must then strictly comply with the schedule: The students of the first term class admitted are expected to remain at college for four years, but, later, discrimination will be made when the students enter, according to their knowledge of the German language, so that the courses will occupy the following periods: Legal course, three years; forestry, three years; building, two years; technical, four years.

The philosophical course will be taught by Chinese teachers; a medical branch is also projected, and a subcourse will be given in gymnastics, music, and art. The minimum age for the school of science is twenty years, and a good knowledge of the preparatory courses is essential to admission. If a student wishes to join the school of sciences without having attended the preparatory school, he must first pass an examination in both Chinese and Western sciences, including the Chinese and German languages.

The present staff comprises twelve German tutors and ten Chinese teachers and interpreters; as the number of students grows the staff will be increased. A translation office will be opened in conjunction with the college to prepare the necessary material. Arrangements have been made by the managers of the German-Chinese high school to open a free course of lectures on popular scientific subjects, illustrated with pictures and experiments, for the benefit of the foreign residents. Besides these lectures, an evening course in the Chinese language and script, as far as necessary for daily use, will be given for the benefit of the German community.

A colonial department was organized in the Foreign Office at Berlin in 1890, and in 1899 a colonial school was established at Witzenhausen, near Göttingen, with the express purpose of preparing practical farmers, planters, stock-raisers, and fruit growers who may be inclined to settle in some one of the German colonies. In all the colonies, graduates of the school are found to-day acting as business managers for German trading companies, owners and managers of plantations, clerks in the government service, etc. The course of the colonial school lasts two years and is so arranged that the theoretical instruction comes in the winter and the practical instruction in the summer. The subjects chosen for lectures are those which will add to the pupils' knowledge of tropical plants and agriculture and of colonal enterprises and politics. The studies include such branches of learning as chemistry, botany, and physics. The institution is well supplied with laboratories and has a large farm and gardens and wood land for the study of forestry, vine growing, etc. The trade shops of Witzenhausen are also open to the students for practical instruction.

It is noticeable that while graduates of the colonial school are found in the African and Asiatic colonies, they prefer the German settlements in the new world, especially in Brazil, Argentina, and Chile, and their expert knowledge and skill are proving of immense value in the commercial and industrial development of those countries.

The growing importance of German colonial enterprise is illustrated in the proposed plans of the new university at Hamburg, which shall include a faculty of colonial science. This faculty will constitute the distinctive feature of the new institution. A. T. S.

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GERRY SCHOOLS. — See HUMANE EDUCATION.

GERSON, JEAN CHARLIER (1363–1429). — Teacher, theologian, and chancellor of the University of Paris, born at Gerson, educated very probably at Rheims, and studied at the College of Navarre in Paris. He early devoted himself to theology, and obtained the degree of doctor in that subject. At the early age of thirty-two he became Chancellor of the University of Paris in succession to his friend and teacher, Peter d'Ailly. His standing as a theologian was high, and he soon gained the title of *Doctor Christianissimus.* Breaking from the scholasticism and dialectic methods of his day, his writings show a return to source material and the Church fathers, and a good knowledge of the classics, while his philosophy was nominalistic colored by mysticism. At the Councils of Pisa and Constance he was an important factor, and his general influence was considerable. He preached to the people in the vernacular, mainly on questions of practical morality, and took a great interest in the young students of Paris, where he tried to introduce some sort of guidance and a moral spirit among them. In a letter he recommended to such a student a study of Greek and Latin works for their content, and for style. As a teacher himself, he looked to Quintilian for the ideal in his field. His chief educational work was the *Tractate on Leading the Little Ones to Christ* (*Tractatus de Parvulis tradendis ad Christum*), which, as is indicated in the title, concerns itself wholly with religious and moral education. The work, which has as its text Mat. xix, 14, is divided into four parts, each with its own text: (1) The necessity and means for educating the young for reverence of God, religion, humanity, and civilization on a basis of habit (La. iii, 29). The means are sermons, private admonition, discipline, and the confessional. (2) On those who offend young children by bad examples (Mat. xviii, 16). (3) On the great service performed by the religious teacher (James, v, 20). (4) Self-defence and apology (Gal. vi, 1). The last ten years of his life he spent in a convent of Cœlestine monks and devoted much time to teaching children.

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GESNER, CONRAD (1516–1565). — Called by Hallam "a man of prodigious erudition." He was born at Zürich. His parents being unable to educate him, he was befriended, housed, and educated by Ammian, the professor of rhetoric, for three years. He resolved to travel, and entered the service of Capito, a Hebrew scholar, at Strassburg. After further travel, he was placed at the head of a school at Zürich. After studying physic, he resigned his school teaching, and, having had a small pension allotted him, he set to work at reading the Greek physicians. For a time he was professor of Greek at Lausanne, and was professor of philosophy at Zürich for the last twenty-four years of his life. Gesner wrote his *Bibliotheca Universalis* in 1545. This was a catalogue of books in Latin, Greek, and Hebrew, and gave criticisms and specimens of many of the works cited. He wrote a continuation of the work in the *Pandectæ Universales,* 1548–1555. These two works attempted to do for general literature what the Digest of Justinian had done for Civil Law. Thus Gesner's books are of the greatest value as a bibliographical encyclopedia of literature up to his times. In 1555 he published *Mithridates de differentiis linguarum tum veterum, tum quæ hodie apud diversas nationes in toto orbe terrarum in usu sunt, observationes.* This is the first great modern book on comparative philology, and attempts a characterization of all ancient and modern languages from the Ethiopic down to the gipsy language. Gesner also wrote the *Historiæ Animalium* published in 1551–1556, containing a critical account of all that had been written and done on zoölogy by his predecessors. His *Icones Animalium* is a volume of woodcuts and names only. As a naturalist Gesner emphasized the method of personal observation instead of relying on the observations of the old classical writers, though he did a great deal in promoting the close study of those writers. He planted a botanic garden for his observation and experiments. He formed a museum in connection with his professorial post and obtained contributions of some specimens from most parts of Europe. He made the ascent of Mont Pilatus near Lucerne and examined all the specimens he could find there, in spite of the superstitions concerning the mountain. He visited patients in Zürich at the time of the plague and devoted himself to the study of the best cures, but he was overtaken by it and died in his Museum in 1565.

He was the greatest encyclopedist of the Renaissance. F. W.

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GESNER, JOHANN MATHIAS (1691-1761). — Prominent philologist and reformer of higher education in Germany; was born the son of a pastor in the small city of Roth in Franconia and received his early education at the gymnasium in Ansbach. In 1610 he went to the university of Jena; in 1715 he was appointed teacher of the gymnasium in Weimar; in 1729 he accepted a call to the principalship of the gymnasium in Ansbach, but finding that this position did not allow him sufficient leisure for his literary activity, he left it the following year and became the head of the old *Thomasschule* in Leipzig. He reëstablished the reputation of the school by restoring the study of the classics, by enriching the course of study, especially through the emphasis laid on mathematics, and by improving the discipline. In 1734 he was called as Professor of Rhetoric to the newly established university of Göttingen and remained there until his death. He lectured on Latin and Greek literature and on classic archæology, but, at the same time, kept up his strong interest in pedagogy. He was the inspector of the Brunswick gymnasiums and conducted, from 1738 on, a philological seminar in which candidates for the teaching profession received a general education together with theoretical and practical training in pedagogy. For this purpose he wrote his *Primæ lineæ isagoges in eruditionem universalem* (*Outlines of an introduction to general education*, particularly to philology, history, and philosophy), which appeared in 1760. As early as 1715, he had written his *Institutiones rei scholasticæ*, a treatise on education, which shows the influence of the ideas of Ratke, Comenius, and Locke.

Gesner's educational activity marks an epoch in the history of classical education in Germany. He is the founder of that great movement in German education which is known as *Neo-Humanism* (*q.v.*) and which controlled the aim and methods of the most influential of the higher schools, and through them the educational ideals of the leading classes of the nation, down to the last quarter of the nineteenth century. He revived the study of Greek, which in Germany at that time had been almost totally neglected, and insisted on the study of the classics for the sake of their great thought content and their ethical and æsthetic value. He believed in arousing in the pupil a pleasurable interest in his work, and, for this reason, he advocated the teaching of the elements of Latin through usage only, and without the help of formal grammar. In this way he was a forerunner of Basedow and of the modern reformers of foreign language instruction. Next to the study of the classics, he emphasized instruction in the mother tongue, in French, mathematics, natural science, history, and geography. Gesner's educational views were backed by a rare combination of great erudition, not only in philology but in several other fields of knowledge, with a long practical experience in teaching and fine pedagogic tact. Through his connection with the Brunswick schools and his training of teachers, he had constant opportunities of testing the actual operation of his theories in practice. It is owing to these favorable circumstances, and to the fact that his work was carried on by such brilliant successors as Ernesti (*q.v.*) in Leipzig and Heyne (*q.v.*) in Göttingen, that the movement initiated by Gesner acquired such a great and lasting influence on the higher education of Germany.

Among the writings of Gesner, besides the works already noted, may be mentioned his various editions of Latin authors, as well as his selections from Cicero, Pliny, and from Greek authors (*Chrestomathia Ciceroniana* 1716, *Pliniana* 1723, *Græca* 1731), the last of which contributed greatly to the improvement of the study of Greek in Germany; his *Thesaurus* of the Latin language, published in 1745 in four volumes; and his *German Essays* (*Kleine Deutsche Schriften* 1756), which contain much of pedagogic value. F. M.

See NEO-HUMANISM.

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GESTURE LANGUAGE. — A method of communication in which movements of the hands or other organs of the body are employed instead of the ordinary movements of articulation. This is a primitive form of language and undoubtedly exemplifies a simpler stage of psychological development than that which is exhibited in articulate language. C. H. J.

See LANGUAGE.

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GETHSEMANI COLLEGE, TRAPPIST P.O., KY. — A Catholic college connected with the Abbey of Gethsemani. Preparatory and commercial departments are maintained, diplomas being conferred in the latter.

GHENT, UNIVERSITY OF. — See Belgium, Education in.

GHERARDO OF CREMONA. — A distinguished scholar and teacher of mathematics in the twelfth century. He was born in 1114 at Cremona, in Lombardy, and died there in 1187. He is known chiefly for his work in astronomy, which included several translations from the Arabic, the Almagest (see Ptolemy) among them. D. E. S.

GIBBS, JONATHAN C. (1831-1874). — A colored educator, educated at Dartmouth College (graduating in 1852) and at the Princeton Theological Seminary. He was in charge of the educational work organized by the Presbyterian church among the freedmen (1863-1868), secretary of state in Florida (1868-1872), and state superintendent of public instruction in Florida (1872-1874). W. S. M.

GIDDINESS. — See Dizziness.

GIESSEN, THE GRAND DUCAL HESSIAN LUDWIG UNIVERSITY OF. — The University of Giessen was founded by Landgrave Louis V, the Faithful, in the year 1607, and owes its origin to the religious conditions of the period. (See Germany, Education in, section on *Universities.*) Giessen, from its inception, possessed the character of a university, although in the beginning the theological faculty was by far the largest and most renowned, the institution being known far and wide as a Lutheran stronghold. To this circumstance may be attributed the fact that at the outbreak of the Thirty Years' War Giessen was one of the most frequented universities in the whole of Germany, being exceeded in size probably only by Leipzig and Jena. As a direct result of political changes, the university was transferred to Marburg in 1625, a religious controversy at the latter institution twenty years previous having led to the secession that was responsible for the organization of a university at Giessen. At the close of the war, another political transfer brought about the reëstablishment of the institution at Giessen, and from that time to the present day the university has had an honored, albeit somewhat modest existence.

A faculty of political economy was established at the university in 1777 and may be regarded as the forerunner of the faculties of political science, but it was disorganized eight years later. In 1829 a school of forestry was established as a branch of the university, and from 1837 to 1875 Giessen also possessed a technical school (at Darmstadt since 1877), both departments being included in the faculty of philosophy. This fact is worthy of comment, as the schools of technology are not affiliated with the universities in Germany. The faculty of medicine includes a college of veterinary medicine, which is the only school in Germany to award the degree of Dr. Med. Vet. From 1830 to 1859 Giessen also supported a Catholic theological faculty.

A new library building was completed in 1904, having been erected at a cost of $125,000; it contains over 230,000 volumes and over 100,000 dissertations and programs. The annual university budget amounts to about $375,000. Giessen is one of the smallest of the German universities in point of attendance, there being 1249 students enrolled in the winter semester of 1910-1911, of whom more than half are registered in the faculty of philosophy, this being followed by medicine, law, and theology, in the order named.

Among former teachers of the university may be mentioned the celebrated jurist Rudolf von Jhering, and the renowned chemist Justus von Liebig; Robert von Schlagintweit, the explorer, served as docent at Giessen from 1863 to 1885. R. T., Jr.

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GIFTS. — See Froebel; Kindergarten.

GILBERT, SIR HUMPHREY (1539-1583). — The navigator and stepbrother of Sir Walter Raleigh. In c. 1572 he devised a scheme for "the erection of an Academy in London for the education of her Majesty's Wards and others the youth of nobility and gentlemen," which was edited from the Lansdowne Ms. by Dr. F. J. Furnivall for the Early English Text Society in 1869. Gilbert bewails the fact that the wards of the Crown were often in the hands of those of evil religion or insufficient quality, and since these wards were chiefly resident in London, he proposes that an Academy be erected and suggests not only the subjects to be taught therein but also the salaries to be paid to the teachers and ushers. A new type of education was proposed, based on a curriculum differing from that of the humanistic schools of the day. Milton's *Tractate* shows a remarkable similarity to Gilbert's work. Masters were to be engaged to teach Latin, Greek, and Hebrew, although a sufficiently important place is assigned to the vernacular, for "in what language soever learning is attained the appliance to use is principally in the vulgar speech as in preaching, in parliament, in council, in commissions and other offices of common weal." Readers were to be appointed for moral philosophy to read "the political part thereof"; for natural philosophy, for mathematics to deal with military art, cosmography, astronomy, and practical navigation. A doctor of physic was to teach physic, chirurgery, and medicines, and was to have a garden and simples. Civil law, divinity, and common law were each to have a reader. Provision was to be made for the teaching of modern languages, dancing, heraldry, defence, horsemanship, strategy, and tactics.

The arrangements for the library are particularly interesting. The keeper is allowed £26 a year. After every mart he "shall cause the bringers of books into England to exhibit to him their registers, and thus to have first choice of books to buy. For the buying of books, etc., for the library £40 was to be allowed. But in addition it is to be noted, "All printers in England shall be forever charged to deliver into the library of the Academy, at their own charges, one copy, well bound, of every book, proclamation, or pamphlet printed." The treasurer's salary was to be £100. The chief governor was to be the master of the wards, assisted by the rector who was to have personal supervision over the pupils. The public readers of arts and common laws were to publish some new book every six years, and every three years to issue a translation of some good book. F. W.

See ACADEMIES, COURTLY; GERBIER; GENTRY AND NOBLES, EDUCATION OF; MILTON.

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GILCHRIST, JOHN BORTHWICK. — See GILCHRIST EDUCATIONAL TRUST.

GILCHRIST EDUCATIONAL TRUST. — An institution established by the will of John Borthwick Gilchrist (1759–1841), a servant of the East India Company and an orientalist. He was professor of Hindustani at London University and took an interest in educational and philanthropic efforts, being associated with George Birkbeck (*q.v.*) in some of his work. He left his property to trustees for "the benefit, advancement, and propagation of education and learning in every part of the world so far as circumstances will permit." He left every arrangement to the discretion of his trustees. The will was the subject of litigation which lasted twenty-five years, and only the fortunate circumstance that part of the property was on the site of Sydney, Australia, rapidly increasing in value, secured any means for the trustees to proceed with their work. The trustees adopted the principle of doing pioneer work in promoting education and learning where other efforts were not being employed. In this way numerous movements have been started, and as soon as they have been taken over by other bodies, the Trust has diverted its support to some new object. Thus, scholarships to aid Indian students to study at English universities were established until the work was taken up by the government and universities were erected in India. Colonial scholarships were also instituted. When Girton College and other institutions were established for the higher education of women, scholarships were provided as well as in training colleges for secondary school teachers. Traveling scholarships for secondary school teachers were established for professional purposes. Reports have been published on educational topics in foreign countries including Educational Systems of Sweden, Norway, and Denmark; French Secondary Education; The Teaching of Literature in Girls' Schools in Germany; Manual Instruction in France and Switzerland; The Teaching of Geography in Switzerland and Italy. When the Board of Education undertook the *Special Reports,* the Trust discontinued the traveling scholarships, just as the system of exchange teachers between England, France, and Germany was begun by the Trust until taken over by the Board. University Extension, the Workers Educational Association (*q.v.*), the National Home Reading Union (*q.v.*), and the Recreative Schools Association have also been assisted by the Trust. At present the Trust money is being used to encourage a system by which young teachers may be afforded opportunities of spending some time in the classrooms of expert and more mature colleagues. A scheme is also on foot for the establishment of a school of Oriental Languages to commemorate the work of the founder. The remarkable success of the Trust has shown the importance of freedom in the management of Trust funds for public purposes. More good work has been accomplished and more success has been achieved in this way than would have been possible under the restraint of the "dead hand" of regulations and provisions, which only too often hamper such bequests, not only in England but in America. The Right Honorable Lord Shuttleworth is at present chairman of the Trust, which has its offices in London.

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Times (London). Educational Supplement, Oct. 4, 1910.

GILDS, MEDIEVAL, AND EDUCATION. — To conceive of the gild as the technical school of the middle ages is to realize only very imperfectly its importance for the history of education. The gilds of merchants and craftsmen which regulated commerce and industry from the eleventh and twelfth centuries onward were only species in a great genus which embraced such widely different institutions as the Universities, the Inns of Court, the Colleges of Physicians and Surgeons on the one side, and the humblest parish burial club or rural coöperative society on the other. The religious fraternity supplied the only available form and sanction for every kind of free association, whatever its aim — political, social, economic, recreative, educational, religious. In its main aspect it may be regarded as the main instrument in the formation of that series of middle classes by whose efforts the principle of self-government was first realized in the narrower sphere of civic life and thence transplanted to the wider sphere of the national state.

Although it is generally confined to the professional and technical aspects of this development, the term "education" applies in a large sense to the whole process of class formation, and a few words may be said as to the social and political education afforded by the gilds. Socially their primary function was to facilitate a transition from the tie of kinship to that of a fellowship based on neighborhood or a common profession. The Saxon gilds of thanes which Maitland has likened to a "county club"; the "frith gilds" of London and the Knights' gilds which in some cases perhaps formed the first nucleus of free civic association, all served this purpose and are connected by it as one continuous social development, both with the merchant and craft gilds and with the parish gilds in town and country. By their instrumentality the process described by Fustel de Coulanges as taking place in the city state of antiquity was carried a stage further. What the fiction of adoption and the artificial widening of the ancestral cult were to the earlier phase of civic expansion, the more attenuated fiction of fraternity, and the foundation of coöperative chantries were to the medieval city. Closely connected with this was a more consciously educational development. The wealthy city gilds took over the halls of feudal magnates and coöperatively emulated their style of life. They feasted kings, and drew nobility, gentry, and clergy into their honorary membership, and were thus one of the main agencies in removing social exclusiveness and in transmitting social manners and ideals from a narrower to a wider circle.

In the political education of the middle ages the gilds played an unique part. They were the main channels through which new classes of the population were drawn into the field of political activity. Their internal affairs furnished an excellent training in self-government and administration, whilst their intervention in municipal and occasionally in national politics gave their ambitious members a wider scope for their powers. The disputes that have arisen as to the part played by the gilds in the earliest phases of civic organization turn upon questions of constitutional form and leave untouched the primary importance of the gilds as generators of political force and organs of political change. In many leading cases at least it is highly probable that the gilds of the twelfth century had as large a share in molding the earlier patrician rule in the cities of Western Europe as the craft gilds of the thirteenth and fourteenth centuries had in transforming it. The proceedings of the gilds, as such, were secret, but they provided periodical opportunities for freely debating questions of policy or of principle, and there can be little doubt that towards the end of the fourteenth century, when the gilds became more numerous and active both in town and country, they often served as centers of political, social, and religious propaganda.

Turning now to education in the stricter sense it is well to emphasize the fact already noted that the greater part of the organized higher education of the middle ages was based on a social structure provided by gilds. "The rise of the universities," says Rashdall, "was merely a wave of that great movement towards association which began to sweep over the cities of Europe in the course of the eleventh century." (See UNIVERSITIES.) The federated gilds of scholars or teachers or both, of which the universities were composed, performed the same functions in regard to the higher education of the professional classes as the later gilds performed in regard to the technical education of the merchant and the craftsman. (See DEGREES; INCEPTION.) The completed gild structure of a London livery company towards the close of the fifteenth century is closely analogous to that of one of the Inns of Court (*q.v.*) or one of the Oxford colleges of the same period.

A link between the universities and the gilds is furnished by the civic corporations of the learned professions. The notaries formed one of the greater gilds of Florence, and probably the regulations imposed by the civic authorities of London in the thirteenth century on pleaders and attorneys were drawn up by a professional gild. In fifteenth-century London the professions of medicine and surgery received from the city a set of ordinances which placed them under the rule of a Rector who must be a Doctor of Medicine, a Master of Arts and Philosophy, or a Bachelor of Medicine of long standing, and the last-named degree was only to be accepted as a temporary makeshift. The gild insisted on previous graduation for full membership, imposed examinations in medicine and surgery, and provided a hall for reading and disputation. Later on, in the seventeenth and eighteenth centuries, the Barber-Surgeons of London, Paris, and Edinburgh provided regular demonstrations in anatomy for the instruction of their members. The London gild of Apothecaries has retained its examining functions down to the present day. (See PHARMACEUTICAL EDUCATION.)

Whilst the medical and surgical gilds were thus able to delegate many of their educational functions to the universities, the gilds of merchants and craftsmen were the sole repositories of the traditional lore of their several callings. It is very probable that they were the main channels by which that lore was transmitted from the East to the West and from the later days of the Roman Empire to the earlier middle ages. Dr. L. M. Hartmann has recently established a strong case for the continuity of the gild tradition at Rome and Ravenna. The style of the earliest cathedral builders has been traced continuously back to the school of "Comacine" masters, whom the Lombards found working in North Italy. The dedications of the gilds of the five fundamental medieval handicrafts afford corroborative evidence which has been hitherto overlooked. The patron saints of the masons — the Quatuor Coronati — were Roman martyrs of the third century; those of the shoemakers — St. Crispin and St. Crispinian — are said to have been martyred at Soissons at the same period. St. Aubert, the patron saint of the bakers of Flanders and Scotland, was Bishop of Cambrai and Arras in the seventh century. St. Eloi, universally venerated by the smiths of the middle ages, was a goldsmith of Limoges who became a missionary Bishop at Noyon under Dagobert. But perhaps the most interesting case is that of St. Severus, a woolcomber, who was Bishop of Ravenna just before the fall of the empire and whose body was afterwards carried, first to Mainz — the place of the first recorded weavers' gild in Germany — and thence to Erfurt, another weaving center, and who is subsequently found as the patron saint of weavers throughout the Netherlands and Scotland. A similar significance attaches to the spread of the cult of St. Nicholas of Myra, the patron saint of Levantine commerce and navigation, which is exactly contemporaneous with the settlement of a hitherto largely nomadic trading class and the rise of the merchant gild. There are early churches of St. Nicholas in close connection with the ports or markets of London, Bristol, Yarmouth, Newcastle-on-Tyne, Liverpool, Ghent, Brussels, Utrecht, Berlin, Frankfort, Leipzig, Hamburg, Prague, Stockholm, Bergen.

It is thus probable that the most important educational service of the gilds was removed before their recorded history begins. In the later period, inaugurated by the grant of royal charters or civic ordinances in the twelfth and thirteenth centuries, the growth of the system of apprenticeship is the central feature of gild history from the educational point of view. The earliest extant records of apprenticeship are private contracts between individuals which stipulate for a premium or certain years of service in return for specified teaching. The authorized regulation of the conditions of apprenticeship by the gilds begins in London, Paris, and elsewhere in the last quarter of the thirteenth century. The urban population was then rapidly increasing. Division of labor was giving rise to new trades for which the craft gild furnished a ready organization, and during the two following centuries a steady stream of rural labor was drawn by this agency into the channels of a higher technical training. The education provided by the gild rested entirely on a domestic basis. As a rule the master craftsman might teach his trade to as many sons as he pleased, but could only have one other apprentice who received board and lodging, clothing and discipline as one of the family. In entering the new household the apprentice passed under the protection of the gild which revised the terms of his contract, furnished a court of appeal against ill usage or defective training, and guaranteed the ultimate attainment of mastership. This produced uniformity within each craft, but the variations of usage between different crafts and different cities remained very wide throughout the middle ages. In Paris the cooks required two years' service, the carpenters four, the chandlers six, the embroiderers eight, the goldsmiths ten. A seven years' apprenticeship, which had become universal amongst London crafts, was adopted as the national standard in the sixteenth century. On the continent a much shorter period of from two to six years was supplemented by the requirement of from three to five years' travel in search of fuller experience. Some of the Rhine cities were much frequented by journeymen as the finishing school of their several trades.

Besides regulating access to the only technical school, the workshop, the gilds largely determined the nature of the instruction thus afforded, not only by an official examination of the aspirants to mastership, but also more effectively by the regular inspection of their trades, backed by civic authority, in which the collective technical conscience of the gild was brought to bear on the methods of the individual craftsman. False work and bad materials were seized and judged by juries of experts. In some crafts, *e.g.* the goldsmiths, the gild affixed its stamp to sound work, in others, *e.g.* the blacksmiths, the pewterers, and even the bakers, each master must have a mark of his own; whilst in the cloth manufacture it became usual to insist on inspection and official sealing at each stage. Technical rules multiplied under the control of the gilds and were afterwards in many cases codified in national legislation. The Act of 1603–1604, which prescribes in fifty-two elaborate sections the industrial technique to be followed by the English leather trades, is an interesting illustration of the cumulative power of gild tradition. It is very difficult to appraise justly the educational value of this tradition. In its later phases, when we know it best, it was almost wholly a hindrance to industrial progress. It was in the earlier and less recorded phases that the gilds performed their real educational service by disciplining crude labor, checking dishonest impulses, and gradually forming a professional sense of honor. But even then the gild's powers of search were often used to exclude the competition of foreign wares. Later on, when the craft gilds acquired predominance in city government, their policy as embodied in their ordinances, their methods of inspection, and their regulation or apprenticeship exhibited a narrower spirit of corporate egotism. The two opposite abuses to which the system of apprenticeship is liable — undue restriction as a means of limiting the number of masters and entire absence of restriction as a means of exploiting youthful labor — both became common in the fifteenth century.

The ordinances of the majority of gilds at the close of the middle ages exhibit a compromise between these conflicting tendencies. New masters are often forbidden to take any apprentices for several years, and then restricted to one, whilst those who sit on the governing body may take two, and those who have held the highest office three. By this time the entrance to mastership had likewise become restricted, partly by the growth of industrial capital, but also by the imposition of artificial conditions. Foremost among these was the institution of the masterpiece, which did not become widespread till the sixteenth century. Originating in simple tests of competent workmanship this developed into the imposition of a task sometimes occupying many months and requiring the use of expensive material besides the payment of heavy fees to the official examiners. The extant rules for the execution of the masterpiece — which in the case of a wide range of Paris crafts cover a period of four centuries — form a valuable contribution to the history of technical education. A jury of scriveners examined candidates in caligraphy, orthography, and casting of accounts. The printers and booksellers required a knowledge of Greek and Latin; the masterpiece of the pinners was a thousand pins; of the shoemakers a pair of boots, three pairs of shoes, and a pair of slippers; of the butchers the dressing for sale of the carcases of a cow, a calf, a sheep, and a pig. But in many cases much more elaborate tests were prescribed or were left to the discretion of the gild authorities who deliberately used them to exclude candidates from the mastership. At the same time the sons of masters and those who could pay a large entrance fee were exempted altogether or subjected to a nominal test. Whilst, therefore, the educational functions of the gilds attained their most explicit and impressive form in the masterpiece, they were simultaneously ceasing to exercise an appreciable influence on the main course of industrial development which by this time was escaping from the corporate restrictions imposed in the older urban centers and seeking a freer environment in the country. However regrettable, it was no doubt natural that the pioneers of the next phase of industrial progress and especially the inventors of labor-saving machinery should have found their chief obstacle in the handicraft traditions of the gilds. (See APPRENTICESHIP AND EDUCATION; INDUSTRIAL EDUCATION.) G. U.

The gilds were, however, more intimately associated with school education in England. Many gilds maintained one or more priests to minister to the members of the fraternity; the practice arose for these priests to keep school for children of members or of the whole town. In time money was left to gilds for the express purpose of engaging a clerk to keep school; elsewhere the gilds paid the schoolmaster out of their funds. Thus at Barnard Castle the Gild of Trinity was "founded and endowed with certain lands, by gift of the brethren and other benefactors of the sons of ancient time to find a priest . . . to say mass . . . and to keep a free grammar school and a song school for all the children of the town." Of 33 gilds investigated by Leach, "excluding the Craft Guilds of London and Shrewsbury, and the Merchants' Gild at York, 28 kept grammar schools; and to them may be added the Drapers of Shrewsbury, who kept a grammar school; while the Mercers of London were trustees for three schools mentioned, and the Goldsmiths for two." In many instances the gild corporations were appointed as trustees of schools and with them were vested the right of appointing or dismissing the schoolmaster, the superintendence of repairs, the school property, the admission of pupils, the drawing up of statutes for the better government of schools, or appointing boards of governors for schools. The Skinners' Company of London became trustees for Tonbridge School in 1552 with power to draw up statutes for the school, and the practice grew up for the governors to pay an annual visit to the school. With the decay of the gild system most of the schools maintained or supervised by the schools became private endowed schools, while only a few schools in London have remained under the control of gilds, *e.g.* Merchant Taylors' School, Stationers' School, and the Mercers' School.

Of recent years, some of the wealthier London companies have devoted large sums to the endowment of technical and university education.

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GILDS, TEACHERS'. — These were associations which arose in the sixteenth century to protect those teachers of primary subjects who had municipal recognition against the competition of the wandering scholars, dame and hedge-schools (*Winkelschulen*). Such organizations were confined to Germany, though at least one is found in Holland-Harlem. There is definite information bearing on the gilds in Munich (1564), Nuremberg (1613), Frankfort-a.-M. (1613), and Lübeck (1653); while they also existed in Augsburg, Landshut, Bamberg, Stuttgart, Tübingen, Urach, and Brunswick. At Lübeck a second gild of teachers of reading and prayers was also organized. Their organization was similar to that of other gilds, which were practically on the decline when the teachers organized. A period of apprenticeship, varying from three to nine years, and beginning with the sixteenth or eighteenth year, was imposed. An examination had to be passed to become a journeyman or assistant teacher. The assistant could be employed for pay by a master and could also give private lessons, part of the proceeds going to his master. When a vacancy occurred in the gild, it was filled by the oldest assistant on proving his ability, usually by writing out, with great flourishes a signboard; a Latin motto, *e.g. Patientia omnia vincit*, or a Biblical quotation, and the master's name formed the content. The gilds struggled with difficulty against competition but without success, in spite of protests to the municipal councils, which supervised and inspected their schools. On the whole their influence was baneful; they kept down the number of schools by increasing the number of pupils in the few favored institutions without adding to the accommodations; the qualifications for membership were not always strictly adhered to; the sons, widows, or daughters of deceased members were sometimes allowed to continue schools without being required to go through the regular routine. Materially the gilds did not improve the position of their members, for many had to supplement their slight income by alms. One advantage, however, did accrue; members of the gilds were *ipso facto* citizens. The gilds lingered on ineffectually until the end of the eighteenth century. The Munich gild was finally dissolved in 1801, the capable teachers being incorporated into the state system. At Nuremberg, the gild was driven out in 1818 on the introduction of paid teachers; while at Lübeck the last was heard of the gild in the same year.

See Teachers' Voluntary Associations.

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GILL, ALEXANDER (1565–1635). — Headmaster of St. Paul's school, London, from 1608 till 1635. He had John Milton as pupil in the school from 1620 to 1625. Gill continued the tradition of Mulcaster's (*q.v.*) interest in the study of the English language as shown in Mulcaster's *Elementarie* 1582, and in 1619 published the book for which he is best known — *Logonomia Anglica, qua Gentis Sermo facilius addiscitur.* He advocated the phonetic spelling, and suggested a reform of the alphabet with that purpose; by introducing the two Anglo-Saxon signs for *th* and other Anglo-Saxon signs, together with dots over the vowels to represent their various sounds, he gets his adequate alphabet. In the feeling of pride in our old Saxon tongue Gill ranks as a pioneer. The most interesting section of the *Logonomia Anglica* is the part devoted to Syntax, where he begins to treat of the figures of speech Following on the lines of Abraham Fraunce (*q.v.*), Gill quotes from English writers to illustrate the English usage in rhetorical figures. The significance of the book is the establishment of Ramus's method of illustration of rhetorical figures from modern sources, the drawing of attention to the beauties of the English literary writers, and the beginnings of the study of English literature in a school textbook. The curious point must be borne in mind, that Gill's *Logonomia* is written in Latin. Gill's son, also called Alexander (1597–1642), in 1621 became under usher of St. Paul's school to his father, and was teacher and friend of Milton. Gill fell in disgrace in 1628, through drinking a health to Felton, the assassin of Buckingham, and belittling the king. Eventually forgiven, he is said to have been an usher in Farnaby's (*q.v.*) school, and in 1635, succeeded his father as High or Head Master of St. Paul's School. He died in 1642, having gained the reputation for great severity in connection with school teaching. F. W.

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GILMAN, DANIEL COIT (1831–1908). — The first president of Johns Hopkins University, and one of the leading influences in American educational development during the greater part of his career. He was born in Norwich, Conn., July 6, 1831, and was of old New England ancestry on both sides. Graduating at Yale in 1852, he pursued graduate studies at Harvard for a year, residing in the home of Arnold Guyot, the geographer; then he spent two years in Europe, where, though an attaché of the United States Legation at St. Petersburg, he found opportunities for seeing and learning much of England, Germany, and France, as well as of Russia. Returning in 1855, he took an active part in advancing the permanent organization of the Sheffield Scientific School at Yale, and became one of the chief promoters there of the ideas of "the new learning." He was an ardent champion of scientific studies as a means of culture, though he fully recognized the claims of the classical education; and it was precisely this attitude that he afterwards manifested in shaping the character of Johns Hopkins University. He was made assistant librarian of Yale College in 1856, and afterwards librarian and professor of physical geography. During his connection with Yale, which ended in 1872 with his acceptance of the presidency of the University of California, he was one of the chief influences making for progress generally, and in particular for the building up of the Sheffield Scientific School. He was also actively connected with the public school system of Connecticut, in which he introduced important improvements. The University of California, under his presidency, from 1872 to 1875, underwent a most remarkable development, in spite of the obstacles interposed by political interference. He became president of Johns Hopkins University in 1875.

The establishment of Johns Hopkins University in 1876 marks an epoch in the history of education and learning in America, and it is to Gilman that the determination of its character must be ascribed. From the beginning, he set before himself the object of making the new institution a means of supplying to the nation intellectual training of a higher order than could be obtained at existing American colleges and universities; and at the end of a year of travel and inquiry he had gathered, as a nucleus, six professors of eminent ability, under whom, with the aid of younger associates, there was launched, for the first time in this country, a university whose standards and activities were on a level with those of the great institutions of Europe. The establishment of full-fledged "graduate schools," the naturalization of research as a leading element in American universities, and the development on a great scale of scientific and scholarly publications, date from the foundation of Johns Hopkins University. And a singular testimony to the importance of Gilman's influence in hastening this development is furnished by the fact that, although it was not until seventeen years later that funds were available for the opening of the Johns Hopkins Medical School, no other institution in the meanwhile attempted to bring about "the prodigious advancement of medical teaching" — to quote President Eliot — which was there effected under Gilman's guidance, and in accordance with the aim that he had cherished from the beginning.

In 1901 Gilman resigned the presidency of Johns Hopkins. In 1902 he became the first president of the Carnegie Institution; he resigned that office in 1904, but continued as a trustee of the institution until his death. Throughout his life, in addition to his educational activities, he was deeply and actively interested in public improvement and in practical philanthropic effort, being, in particular, one of the pioneer workers in charity organization and in civil service reform. He succeeded Carl Schurz as president of the National Civil Service Reform League; his connection with the Peabody Fund, the Slater Fund, and the Russell Sage Foundation was of great importance; and he served on many public and semi-public commissions. His contributions to periodical literature were numerous, and he was one of the chief editors of the *New International Encyclopedia*. He wrote a *Life of James D. Dana* and the volume on *James Monroe* in the "American Statesmen" series. He edited the *Miscellaneous Writings of Francis Lieber*, and prepared an edition of De Tocqueville's *Democracy in America*, for which he wrote an elaborate introduction. Two other volumes published by him are *University Addresses* and *The Launching of a University*. He died at Norwich, Conn., Oct. 13, 1908. F. F.

See JOHNS HOPKINS UNIVERSITY.

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GILPIN, WILLIAM (1724-1804). — Schoolmaster, author, and artist. He graduated B.A. at Oxford in 1744 and was ordained in 1746. A few years later he took over a boarding school at Cheam, Surrey, which he kept successfully for nearly thirty years and handed on to his son. The school is still in existence under the charge of a descendant of Gilpin. The distinguishing marks of the school were the study of the vernacular, of gardening and business, the boys engaging in practical commerce on their own accounts; the elimination of corporal punishment, replaced by trial by jury and fines which were spent for the general welfare of the whole school; and confidence in and reliance on the boys' sense of honor. As Vicar of Boldre Gilpin took an active interest in the social welfare of his parishioners and gave a number of his pictures to endow a parish school. In 1779 he published *Lectures on the Church Catechism*, which had been prepared earlier for his pupils. His writings consisted of biographies of eminent English Churchmen, including his own ancestor Bernard Gilpin, and descriptions of points of artistic interest in England accompanied with his own sketches.

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GIRARD COLLEGE, PHILADELPHIA, PA. — An institution founded by the will of Stephen Girard (*q.v.*) for "poor white male orphan" children, and opened in 1848. The institution was placed in trust of the Councils of the City of Philadelphia, and is now managed by the

Board of Directors of City Trusts. Alexander Dallas Bache (*q.v.*) was appointed the first president and was sent by the trustees to Europe to make a survey of the educational institutions and systems. By one of the terms of the will "no ecclesiastic, missionary or minister of any sect whatsoever" is admitted in any capacity within the premises of the institution. An attack on the will failed in the courts on the ground that the exclusion of ministers was not necessarily an attack on religion or broad religious teaching. Orphan (*i.e.* fatherless) boys are admitted between the ages of six and ten years and receive a training such as will enable them to earn their own living at fourteen to eighteen years of age. The enrollment in December, 1911 was 1491.

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GIRARD, JEAN BAPTISTE (1765–1850). — Better known as Père Grégoire Girard, a contemporary and fellow-countryman of Pestalozzi. Born in Freiburg, he attended the Jesuit school there and at the age of seventeen joined the Franciscan Order. He spent his novitiate in Lucerne and thence proceeded to the University of Würzburg, where he studied theology. When the Swiss government had the reform of public education under consideration, he drew up a plan for primary, secondary, and cantonal schools and a national Swiss university, as a result of which he was appointed secretary to the Minister for Culture and Education, to act as advisor in the Catholic interests. Finding that his advice was rarely sought, he became pastor in Berne (1800–1804), where his broad humanitarian sympathies cut across denominational limitations and endeared him to everybody. He devoted himself mainly to the study of education and was inspired by the efforts of Pestalozzi at this period. His opportunity came in 1804 when he was called to his native city to organize public education. For more than twenty years he strove with great success to reform educational practice and theory. Starting with 40 pupils, the school in 1820 had 400 pupils, and the idea of education became established as essential to public welfare, not only in the minds of most of his fellow-citizens, but also in the surrounding cantons. The school was much visited by foreign observers. But the work of Pestalozzi tended to overshadow that of Girard who aimed to put the master's theories into practice so far as possible. In 1809 he was sent with the commission appointed by the government to Yverdun, and his report on the whole was satisfactory (*Rapport sur l'Institut de Pestalozzi présenté à la haute Diète de la Suisse*). Unfortunately the labors of Girard were suspended by the reactionaries as tending to undermine religion and as being revolutionary, and in 1823 the school was closed. Girard retired to Lucerne, where he devoted himself to writing and recommending educational reform.

Girard was strongly influenced in the direction of the moral and religious end of education. Pestalozzi's work he criticized on the ground that too much emphasis was laid on the intellectual and too little on the emotional and volitional aspects. He accepted the theory of harmonious development as the aim of instruction, but here again he held that Pestalozzi overemphasized the mathematical subjects, which he feared would lead to materialism. Nature study, history, and geography were all to lead to a recognition of God, much in the same way as Froebel proposed. The lack of teachers compelled Girard to adopt the monitorial system (1816), which, strangely enough, formed the center of attack on the part of his opponents. His school was divided into four grades, and each subject was reviewed anew and expanded in each grade. He won the affection of his pupils to a remarkable degree, and on his way to and from school he was always attended by a large group of them.

His chief work was the *Langue maternelle enseignée à la Jeunesse comme Moyen de Développement intellectuel, moral et religieux* (*The vernacular taught to the young as a means of intellectual, moral, and religious development*), in seven volumes, the first dealing with his pedagogical views. Here he recognizes the loosening of the bonds of family, church, and state, and for that reason urges control through moral and religious education. This work secured him in 1844 the prize awarded by the Paris Academy. Other works were *Dialogues sur l'Institution des Écoles de Campagne; Divers Discours et Dissertations sur des Sujets de Pédagogie généreal; Des Moyens d'attacher la Jeunesse à ses Études et d'activer ses Progrés.*

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GIRARD, STEPHEN (1750–1831). — Founder of Girard College for Orphans; attended the schools of France, but was largely self-educated. He was for many years engaged in commercial pursuits, and left his fortune to various philanthropic and educational institutions. He bequeathed $2,000,000 for the establishment of a college for orphans in Philadelphia. W. S. M.

See Girard College.

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GIRLS, EDUCATION OF. — The various aspects of this subject are treated under separate titles. The existing practices concerning the education of girls with boys are presented under the title COEDUCATION. One phase of this question is discussed briefly under SEGREGATION. The history of the education of girls in America is included in the article on COLONIAL PERIOD IN AMERICAN EDUCATION. The early history of European practice is included in the article on MIDDLE AGES, EDUCATION IN. The general place of girls' education in various countries at the present time is given in the articles on the separate national systems. The entire subject of higher education is treated *in extenso* under the caption WOMEN, HIGHER EDUCATION OF.

GIRLS' PUBLIC DAY SCHOOL TRUST. — An organization founded in England in 1872 to provide secondary education for girls. It was an outcome of the larger movement which centered in the National Union for Improving the Education of Women. The Trust numbered among its promoters Mrs. William Grey, Miss Gurney, and Sir J. P. Kay-Shuttleworth. The work was organized on a commercial basis, and the shareholders receive a dividend of five per cent, any surplus being devoted to improving the schools. The first school was opened at Chelsea. The aim of the Trust is declared to be to provide for girls opportunities similar to those open to boys in the great Public Schools. " Particular stress is laid on the formation of character by moral and religious training and for fitting girls for the practical business and duties of life." A full secondary school course is provided in all the schools, which number more than thirty and have over 7000 pupils. A training department for teachers in secondary schools, as well as in drawing and music, is maintained at the Clapham High School, which also prepares for the Teachers' Diploma of London and Cambridge Universities and the Froebel Certificate. Special courses in domestic economy are given in some schools to pupils who have completed the regular courses. The fees charged vary according to the age of the pupil from £9 9*s.* to £15 15*s.* ($47–$78 a year). A few scholarships are maintained at each school.

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GIRTON COLLEGE, CAMBRIDGE, ENGLAND. — An institution founded in 1869 at Benslow House, Hitchin, for the higher education of women. It was the outcome of the efforts of Miss Emily Davies who had unsuccessfully tried to influence the Schools Inquiry Commission (1865–1867) to support the establishment of such an institution. Through her book *The Higher Education of Women* (1866) she had contributed to the progress of the women's educational movement in England. In 1868 she secured influential support and subscriptions which led to the opening of the house at Hitchin with six students. In 1873 the college was moved to Girton College, near Cambridge. Instruction was given by the resident tutors and several professors of the University along the lines of the university requirements, and the students were admitted to university lectures by courtesy. In 1881 the Senate granted permission to the students to present themselves for the university Tripos examinations for degrees; the College grants degree certificates, but not degrees on the results. At the same time the lectures were thrown open to the women. The remarkable successes of the students gave a considerable impetus to the cause of higher education of women, a large majority of the alumnæ having devoted themselves to teaching in girls' secondary schools. The enrollment of the college in 1909–1910 was 158.

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GLADSTONE, WILLIAM EWART (1809–1898). — The great English statesman did not play as great a part in the development of English education as might be expected from his general interest in national welfare and progress. He approached the question of elementary education almost entirely with a strong belief in the claims of an established church. In 1838 he was a member of the Select Committee for the Education of the Poorer Classes appointed to consider the best means of providing useful education in large towns. Gladstone insisted on religious education as a basis for state aid. It was about this time, too, that he proposed the establishment of teachers' training schools in every diocese, and the licensing of teachers by bishops. In 1854 he was instrumental in removing tests on admission and graduation at Oxford, although he insisted that the teaching and governing remain functions of the Church of England. He was opposed to a Crown Commission to inquire into the universities and would have preferred reform from within. When the Education Bill of 1870 was brought forward by Forster (*q.v.*), Gladstone was lukewarm in his support. As he himself admitted later in a review of a biography of Forster (*Nineteenth Century,* September, 1888), his views " were by no means identical with the views of Forster."

"My responsibility," he writes, "is that of concurrence rather than of authorship." He would have preferred a system of local option on the question of religious instruction, for, as he says, "in all things, including education, I prefer voluntary to legal machinery, when the thing can be well done either way." In 1873 he undertook the difficult question of Irish University Reform, and in attempting to compromise met with the opposition of both Catholics and Protestants on account of his "gigantic scheme of godless education."

As a scholar Gladstone stood high. His love for the classics ranked almost next to his devotion to his religion. Any proposal to introduce pure science, natural science, modern languages, and modern history as subjects equivalent to Latin and Greek he refused to consider as possible; all of the new subjects he regarded as "auxiliary" to classical training. And his argument for classics was based not only on their cultural and disciplinary value but on the fact that "European civilization from the middle ages downwards is the compound of two great factors, the Christian religion for the spirit of man, and the Greek, and in a secondary degree the Roman, discipline for his mind and intellect." At the same time he recognized that such an education was for the élite only; "it can only apply in full to the small proportion of the youth of any country who are to become in the fullest sense educated." While Gladstone's influence on English education was very slight, the point of view of the leader demands attention, for it is representative of the opinions prevailing in England in the middle of the nineteenth century.

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GLASGOW, THE UNIVERSITY OF. — A coeducational institution situated in Glasgow, Scotland, founded (1451), like most other ancient universities, by the authority of the Church of Rome. The Bishop of Glasgow and his successors in office were appointed to rule over the college. Up till 1460 the university seems to have had no permanent home, but in that year, James, Lord Hamilton, bequeathed to the Principal of the College of Arts, and his successors in office, a tenement with four acres of land adjoining, situated in the old High Street of the city. In buildings on this site, the classes of the university continued to meet for upwards of four hundred years, until the new university buildings situated at Gilmorehill were ready for occupation in 1870. Owing to the ecclesiastical changes, and the political conditions of the country, the university passed through many vicissitudes during the first two hundred years after its establishment, and it was not until the beginning of the eighteenth century that it began to make steady, continuous, and permanent progress. This manifested itself in (1) the specialization of the teaching within the University, and (2) in the establishment of new chairs. During the last decade of the seventeenth century and the whole of the eighteenth century, eight new professorships were established, viz.: mathematics (1691), humanity (1706), oriental languages (1709), civil law (1712), medicine (1712), history (1716), anatomy (1718), and astronomy (1760). Thereafter, for nearly fifty years, no additional chairs were added; but beginning with the establishment of the chair of natural history (1807) there came the establishment of professorships in surgery (1815), midwifery (1815), chemistry (1817), botany (1818), materia medica (1831), institutes of medicine (1839), forensic medicine (1839), civil engineering (1840), conveyancing (1861), English language and literature (1861), biblical criticism (1861), clinical surgery (1874), clinical medicine (1874), naval architecture (1883), history (1893), pathology (1893), and political economy (1896). During the present century separate chairs have been founded in geology (1903), zoölogy (1903), and mining (1906). Further, since 1892 many additional lectureships have also been established, the more important being those of French, German, Italian, and Celtic in the Department of Language and Literature; education, psychology, and political philosophy in the Department of Philosophy; constitutional law and history, and economic history in the Department of History and Law. In addition, both in medicine and in science, lectureships in the more specialized departments of these subjects have been recently instituted.

The present buildings in the west of the city were opened in 1870. In addition to the buildings used for teaching, there is also the Bute Hall, the gift of the late Marquis of Bute. Here are held the graduation and other important ceremonies of the university. Residences are provided within the grounds for the principal and several of the professors. In 1893, as a result of the admission of women students to the universities of Scotland, the Governors of Queen Margaret College, an institution for the higher education of women and housed in North Park, handed over to the university its buildings and grounds for the use of the women students. Since then Queen Margaret College has ceased to be an independent institution and has been wholly incorporated with the university. Within recent years, extensive additions have been made to the original buildings at Gilmorehill, including (*a*) classrooms and laboratories for the teaching of engineering; (*b*) lecture rooms, a museum and herbarium for the teaching of botany; and (*c*) an extension of the anatomical department. Two other groups of buildings have lately been added, one for the teaching of physics; the other to provide better accommodation and equipment for the teaching of physiology, materia medica, and forensic medicine.

The present constitution of the university dates from the passing of the Universities (Scotland) Act of 1858, and as amended by the Act of 1889, and is similar to that of Edinburgh (*q.v.*) and other Scottish universities. The University Court, now composed of fourteen members, representative of the General Council of graduates of the *Senatus Academicus* and of the students, is the chief governing and administrative body; the duties of the Senatus being mainly concerned with the regulation and superintendence of the teaching and discipline within the university. The work of the university is, at present, divided into five faculties or departments, viz.: the faculties of (1) arts; (2) science; (3) medicine; (4) law; and (5) divinity.

The Faculty of Arts is the largest in the university and is attended by more than 1200 students yearly. It provides a course for graduation in arts. The work of the faculty is divided into four departments, viz.: those of language and literature; of mental philosophy; of mathematics and science; and of history and law. The course for graduation may be taken either in five or six subjects, provided that when a course of five subjects is taken, two of these must be studied during two sessions, and an examination passed on a higher standard than in the other three subjects of the course. If a curriculum of six subjects is chosen, one of these must be studied during two years, and of the other five, two must be cognate (*e.g.* logic and moral philosophy) and must be taken up in separate sessions. A further regulation enacts that every curriculum for the ordinary degree in arts must include a philosophical subject, either logic or moral philosophy. The degree with honors in arts may be taken in the following departments of study, viz.: (*a*) classics, (*b*) philosophy, (*c*) mathematics and natural philosophy, (*d*) English, (*e*) history, (*f*) economics, (*g*) French and German, (*h*) French, Italian, Latin (any two), (*i*) Germanic language and literature (with English), (*j*) Celtic language and literature (with Latin), (*k*) Semitic languages (Hebrew and Arabic).

In the Faculty of Science, in addition to the course leading to the degree of Bachelor in Pure Science, courses are also provided in applied science, leading to the bachelor's degree in (*a*) engineering, in (*b*) agriculture, in (*c*) public health, and in (*d*) pharmacy. Higher degrees in both science and arts may be conferred on graduates on the presentation and approval of a thesis after five years from the date of their graduation.

In the Faculty of Medicine, courses are provided for students leading to the degree of Bachelor of Medicine and Bachelor of Surgery (M.B., C.M.). The course normally extends over five years. Holders of the lower degree may on certain conditions proceed thereafter to the degree of Doctor of Medicine (M.D.) or Master of Surgery (M.Ch.).

The Faculty of Law provides two degree courses, one open only to graduates and leading to the degree of Bachelor of Laws (LL.B.), and the other and lower degree of Bachelor of Law (B.L.) open to non-graduates in arts on certain conditions. The faculty of divinity provides a course for graduates in arts leading to the degree of Bachelor of Divinity (B.D.). Honorary degrees may also be conferred in law (LL.D.) and in divinity (D.D.).

The total number of students in attendance during session 1909–1910 was 2728, made up as follows: arts, 1253; medicine, 698; science, 443; law, 204; divinity, 61. Enrolled in more than one faculty 20, single-course students, 48. Since 1892, when the University was thrown open to women students, the number has gradually increased. In session 1909–1910 women students numbered 642, of whom 534 were enrolled in the Faculty of Arts and 71 in the Faculty of Medicine. The staff of the University, at present, embraces 32 professors and 52 lecturers (exclusive of assistants to professors). A. D.

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GLENALMOND, TRINITY COLLEGE. — See GRAMMAR SCHOOLS, ENGLISH; COLLEGES, ENGLISH; PUBLIC SCHOOLS.

GLOBES. — See MAPS.

GLOMERY. — This word is simply a corruption of the word "grammar," dating (apparently) from the thirteenth century. Owing to its use at Cambridge as late as the sixteenth century, where the Master of Glomery (*Magister glomeriæ*) in 1533–1544 exercised the functions, afterwards performed by the professor of Greek and the Public Orator, of presenting for degrees, a great deal of wild guessing took place as to its meaning. Fuller, in his *History of the University of Cambridge*, published in 1659, leaves it as a mystery. "Let it suffice us to know that the original of the word seems barbarous, his office narrow and topical (confined to Cambridge) and his certain use at this day antiquated and forgotten." Even Dr. Rashdall, in his *Universities of Europe*, speaks of the Master of Glomery as a "wholly peculiar Cambridge institution." Dr. Caius, the Elizabethan historian of Cambridge, had derived the name "as if so called *a glomerando* from 'going round about' the Regent-houses to collect the votes at congregations; or from 'gathering their votes glomerated,' that is, rolled and rounded up in a piece of paper."

In point of fact the Master of Glomery at Cambridge was at first nothing more than the grammar schoolmaster. The first extant notice of him is in a document of the year 1276, in which the Bishop of Ely regulated the relations and defined the area of jurisdiction of the Master of Glomery, the Chancellor of the university, and the Archdeacon of Ely. The grammar master is to have exclusive jurisdiction in all cases in which grammar scholars (*glomerelli*) are dependents, as other masters have in the cases of their scholars, so that whether university scholars or laymen wish to convene grammar scholars or get anything from them by judicial process they shall do it before the Glomery Master unless it be a question of rent of lodgings or involving loss of university rights when the Chancellor is to decide. The grammar beadle was not to carry his mace in university convocations nor before the Chancellor, but he might continue to do so elsewhere, especially when executing his office. This document is of great interest in the history of universities as it showed how the later jurisdiction of the Chancellor of the students of the higher or university faculties had eclipsed the glory of the preëxisting grammar schoolmaster. That the Glomery Master was nothing more is clear from the oath which he took on admission by the Archdeacon of Ely to discharge all the duties of the glomery school of Cambridge (*opera scolarum glomeriæ Cantibrigiæ*) without any extortion from the scholars. The oaths and names of the Glomery Masters until 1437 are preserved in the Archdeacon of Ely's book now at Caius College. The Glomery School was, under the title of Gramer Scole, granted to trustees of King's College and incorporated in its site in 1440, but the lane in which it had stood was still called Glomery Lane when Dr. Caius wrote in the reign of Elizabeth. After 1437 the Glomery Master appeared to have been merely the superintendent of the grammar schools in Cambridge and head of the grammar faculty presenting candidates for the degree in grammar. The last who enjoyed the title was Sir John Cheke (*q.v.*) in 1533–1534, and it is presumed that his office was deemed to be merged in that of the Professor of Greek. That the term is not peculiar to Cambridge appears from the earliest account roll of the grammar school attached to Merton College, Oxford. In the year 1277, 20*s*. was paid to the grammar master (*magistro glomerie*) for five boys for one term, or at the rate of 4*s*. a head. At Bury St. Edmunds, in 1288 or 1289, an official issued a mandate against certain pedagogues wrongfully usurping the title of master who presumed to keep adulterine schools, pretending to teach dialecticians, grammar scholars (*glomerellos*) against the will of the schoolmaster of St. Edmunds, and directing their excommunication. A similar mandate, a few years later, was directed against John Harrison for teaching *glomerellos* and other pupils. At Salisbury in 1308 the grammar schoolhouse is described as *scole glomerie*, which in 1322 appears as *scole gramaticales*, thus establishing the identity of meaning beyond doubt.

The corruption is probably of French origin as it appears in the *Battle of the Seven Arts* of Henry d'Andely written about 1250 (ed. A. Heron, 1881) in which the glomerians assemble at Orleans, where classics were still the predominant study, under the banner of grammar, to attack the logicians intrenched at Paris.

A. F. L.

GLOSSARIES, GRÆCO-LATIN. — See VOCABULARIES.

GNOSTICISM. — During the second century of the Christian Era there arose a strange medley of doctrinal speculations, known as Gnosticism, which disturbed the peace of the Church and necessitated the development of a Christian theology. They represented a systematic effort to fuse Christianity into the vast fabric of speculation erected by philosophic thought. Men of keen intelligence, having embraced Christianity, naturally applied to its investigation the methods of Jewish learning and Greek philosophy. There soon sprang into existence a multitude of pantheistic-idealistic sects, varying widely in their ideas, but agreeing upon certain basic principles. They all professed a *gnosis* or spiritual enlightenment. They regarded Christianity as a system of metaphysics to be expressed in the categories of speculative thought. They held that the soul attains its rightful end, not by faith and works, but by receiving a tradition of knowledge, communicated only to the initiated few and to which the masses of mankind could not attain. This doctrine of salvation by knowledge limited the enjoyment of religion to a few illuminati. The Gnostics were "those who knew," a superior order of beings apart from ordinary believers. Most of them were dualists. Adopting the familiar axiom of the philosophers, "evil inheres in matter," they despised the physical world as the creation, not of the Supreme Deity, but of a Demiurge, a limited secondary god. Some said matter was eternal, others explained it as rubbish remaining after the completion of the spiritual *pleroma*, the result of accident or negligence in the process of creation. They regarded the human body as an incumbrance in which the soul is held captive and from which it will escape at death. They denied the resurrection of the body and explained away the Incarnation of Christ, generally adopting the *docetic* theory, that Christ was a pure spirit with a phantasmal or apparitional body. To account for the evolution of the universe, they called into existence a series of "endless genealogies," a long chain of lower gods or *æons*, connecting the world with God. The Demiurge and the material world were more or less antagonistic to God, and this present existence was essentially evil. Thus Gnosticism was a philosophic and religious pessimism. It was too speculative to be bound by scriptures, creeds, and sacraments. There was no central authority. Every Gnostic teacher shaped his theories to suit himself and garnished them with "great swelling words." The Gnostics were more active than the orthodox Christians in literary and educational work. Their great teachers — Basilides (c. 125), Valentinus (125–140), Bardesanes (154–222), Heracleon (c. 160), and Marcion (c. 150) made many disciples who became famous educators and founded colleges in Antioch, Alexandria, and other centers of learning to which multitudes of students were drawn. They produced a vast and varied collection of writings, most of which have perished. The Gnostic theories possess a curious interest for the scientist, and especially the psychologist, because of their original and often fantastic efforts to solve the great problems of life and mind. W. R.

See ALEXANDRIA, SCHOOLS OF.

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GODDARD, WILLIAM STANLEY (1757–1845). — One of the most influential Headmasters of Winchester College. Himself educated at Winchester and Merton College, Oxford, where he graduated B.A. in 1781, he became usher or second master at his old school in 1784. Under Dr. Warton, headmaster at this time, the numbers had dwindled, discipline was lax, and scholarship was low. As a result of a "rebellion" of the pupils, Dr. Warton resigned and was succeeded by Dr. Goddard in 1796. He introduced a new spirit into the school; the numbers increased; the standard of scholarship was raised; but above all he showed great tact in managing boys, in putting trust in them, and in permitting a certain measure of self-government. Dr. Arnold was a pupil at Winchester under Goddard, and there can be no doubt that he owed much to his influence and to Winchester traditions; to Goddard's tact Dr. Arnold frequently recurred. A large number of boys educated at Winchester at this period attained eminence in later life. Dr. Goddard retired in 1809, became prebendary of St. Paul's in 1814, canon of Salisbury in 1829, and died in 1845. He gave, during his lifetime, £25,000 to his old school to be used for masters' salaries in place of the iniquitous system of gratuities.

See WINCHESTER COLLEGE.

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GODWIN, MARY WOLLSTONECRAFT (1759–1797). — An English author, the wife of William Godwin (*q.v.*), whose political and social theories she shared. Impatient with a system of female education which made puppets of girls and killed individuality, she wrote, in 1792, the *Vindication of the Rights of Women*, a remarkably capable plea for the political, social, and intellectual enfranchisement of women. Her general thesis is "make women rational creatures and free citizens and they will quickly become good wives and mothers; that is, if men do not neglect the duties of husbands and fathers." Women should be "free from all restraints by allowing them to participate in the inherent rights of mankind." Hence she was strongly opposed to the type of education proposed by Rousseau for Sophia. In a chapter on National Education, Miss Godwin takes occasion to criticize severely private education and private and boarding schools, which are marked by tyranny and slavery to forms. The private schools give little thought to moral training, the masters considering their duty done if they teach Latin and Greek and send a few good scholars to the universities. But "it is not for the benefit of society that a few brilliant men should be brought forward at the expense of the multitude." Hence she advocates a system of national education in the first years, at least, on a purely democratic basis. A national system should provide a common school for children of all classes from the age of five to nine. Reading, writing, and arithmetic, natural history, simple experiments in natural philosophy, botany, mechanics, astronomy, religion, history, and politics would make up the curriculum, but play in the open air must never be neglected. After the age of nine the poorer children would go to industrial schools for vocational training, while the rich would study languages, science, history, and politics. Both sexes were to be educated together, for coeducation serves to perfect both not only morally, but for companionship through life.

In her other work, *Thoughts on the Education of Daughters* (1787), she also attacks the narrow training of girls for the drawing room, which was so characteristic of the time. Suggestions are here offered for the education of girls which would replace the prevailing superficiality, weakness, dependence, and affectation of women by a healthy independence and desire to share in the world's work as the companions of men. Mrs. Godwin, always devoutly religious, took a strong interest in moral training of children, and translated Salzmann's *Moralisches Elementarbuch* (*Elements of Morality*, 1790), with modifications to suit English conditions. (See SALZMANN, CHRISTIAN GOTTHILF.)

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WOLLSTONECRAFT, MARY (MRS. GODWIN). *Vindication of the Rights of Women,* edited with introduction by Mrs. Henry Fawcett. In Humboldt *Library of Science,* Vol. XV. (London, 1891.)

GODWIN, WILLIAM (1756–1836). — English political philosopher, novelist, and antiquarian, the son of a dissenting minister and himself a minister from 1778 to 1783, when he came under the influence of the French philosophers and English republicans. He sympathized with the theory of the French Revolution, but hardly with the methods of procedure. He associated with the most prominent English radicals, and in 1793 his *Enquiry concerning Political Justice and its Influence on Morals and Happiness* placed him at the head of the extremists. This work, which attracted considerable attention and was a source of inspiration to many young men, was an attack on all forms of government as means of constraint and control. The relations of individuals in society should be regulated on a basis of justice, " a principle which proposes to itself the production of the greatest sum of pleasure and happiness," and this principle in turn depends on reason. Godwin's belief in the perfectability of man was connected with his belief that reason could be improved indefinitely. Hence he believed in the boundless possibilities of education, of which all alike were capable. In this work Godwin held that the differences between individuals due to heredity were of small account and would disappear under the influence of a common education. The administration of education he would not leave in the control of a national government, since it would tend to perpetuate its own opinions and would prevent the development of an open mind ready to search for truth rather than to accept opinions; and, further, private endeavor on the part of teacher and taught would be accompanied by " enthusiasm and energy." But while this work was evidently written under French influence, there is little trace of Rousseau in Godwin's educational writings: *The Enquirer, Reflections on Education, Manners, and Literature* (London, 1797), and *Thoughts on Man; his Nature, Production, and Discoveries* (London, 1831). In the Preface of the earlier work the author declares his belief in the intimate connection between the cause of political reform and the cause of intellectual and literary refinement. The objects of education are the attainment of happiness, virtue, and wisdom, each of these depending on the other. In discussing the value of private (tutorial) or public education (*i.e.* in school) Godwin argues in favor of the latter on social grounds, for " to practice upon a smaller theater the business of the world must be one of the most desirable sources of instruction and morals," and further, the child learns more from intercourse with his companions than from the teacher. The purpose of education is to " provide against the age of five and twenty a mind well regulated, active, and prepared to learn." Hence the importance which he attaches to habit formation in the young; the school is not to impart knowledge so much as habits of intellectual activity. Godwin accepted the disciplinary value of the classics, for the retention of which he states arguments which have not since been improved upon by their advocates. But the most remarkable pronouncement is that on method in the essay *Of the Communication of Knowledge*, an anticipation of the doctrine of interest. " The best motive to learn is a perception of the value of the thing learned; the worst motive . . . may well be affirmed to be constraint and fear; there is a motive between these . . . desire not springing from the intrinsic excellence of the object, but from the accidental attractions which the teacher may have attached to it." If his plan of giving the pupil a motive to learn and smoothing out his difficulties is adopted, the author believes that the face of education will be changed and " no such characters are left upon the scene as either preceptor or pupil." According to the new method " the pupil should go first and the master follow." While he admires " the treatise of Rousseau upon education " as " probably a work of the highest value," he criticizes his system severely because of lack of frankness on the part of the tutor and because of the deception played on the pupil, for " his whole system is a series of tricks, a puppet-show exhibition, of which the master holds the wires, and the scholar is never to suspect in what manner they are moved."

In the *Thoughts* Godwin has clearly made some advance in educational theory. While he still has faith in the great educational value of the classics, he advises that a pupil who has no ability for language should be taken away from those studies. More respect should be shown to individuality; the capacities of a scholar should be studied and his career and education should follow accordingly. An ill-adapted curriculum is frequently at fault rather than innate stupidity, for " nature never made a dunce." Godwin is thus compelled to recommend a wider curriculum, including "the rudiments of all the sciences that are in ordinary use," than he had done in the *Enquirer*. In this volume there is also an attack on phrenology and insistence on the unity of the mind. The author discredits the view put forward by the phrenologists that an individual is endowed with special abilities, and shows that a child may be born with general ability which can be directed to special ends. Godwin's political work was soon forgotten, and his educational writings, though full of sound common-sense views and sympathy, did not exercise any marked influence.

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GOETHE, JOHANN WOLFGANG (1749–1832). — Although Goethe has not formulated any connected system of education, his works contain some of the deepest and most fruitful pedagogic thoughts. His interest in education was early aroused through the works of Basedow and Rousseau; in Weimar he directed the education of the son of Frau von Stein, a young man of rather mediocre talents, whom Schiller, however, pronounced a "pedagogic masterpiece"; and, as a minister, he exerted a great influence on the educational affairs of the duchy of Weimar. Above all, Goethe studied the development of his own mind, striving to raise himself to higher and higher levels. This conscious process of self-education, coupled with the poet's profound insight into human life, invests Goethe's ideas on education with a great interest and significance. Goethe realizes the necessity of education, although he believes that the educator cannot put anything into the mind which is not already there by nature. The method of education must be self-activity; education must be positive and not repressive, education through fear is the worst of all.

The object of education, according to Goethe, is the development, from within, of all the powers of the human mind, so as to produce an harmonious personality which will be active in the service of society. This social view of education finds expression in the description of the "pedagogic province" of his novel *Wilhelm Meister's Wanderjahre*. In this province, which forms a small state in itself, and from which all unpedagogic influences are carefully excluded, boys are educated in common, each for that kind of occupation for which he seems to show the greatest aptitude. Their education is thoroughly practical, and is permeated by an ethical spirit to which Goethe gives the name of "reverence." Three kinds of reverence are inculcated: for that which is above us, that which is around us, and that which is beneath us; in other words, for God, Humanity, and Nature. From these three reverences springs the highest, which is self-reverence. These ethical teachings are embodied in appropriate symbols and transmitted by song.. F. M.

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Spalding, J. L. *Opportunity and Other Essays*, pp. 142–189. (Chicago, 1900.)
Venable, W. H. *Let Him First be a Man*, pp. 195–212. (Boston, 1894.)

GOLDEN SECTION. — When a spacial figure is so divided that it obeys the formula — the longest side is to the shortest side as the sum of the two sides is to the longest side, the division is especially pleasing to the observer and is designated the golden section. This formula is obeyed by ornamental crosses, by books and pictures, to such an extent that it is evident that the relation is common and natural to even untrained individuals. The explanation of the satisfactory character of this division is not easy to give. Such a division departs from absolute symmetry enough to give variety, and it is near enough to symmetry so that neither dimension is extravagantly different from the other. C. H. J.

See Æsthetics.

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GOLDSMITH, OLIVER (1728–1774). — The English poet and writer has left among his writings some excellent descriptions of the life of an assistant or usher and a criticism of the education of his day. As a boy he had been moved about from school to school with but little intellectual profit from any of them. It is supposed that it is the master of the second school which he attended, Thomas Byrne, a retired soldier, who is the prototype of the Village Schoolmaster in the *Deserted Village*: —

> "And still they gazed and still the wonder grew
> That one small head could carry all he knew."

As a student he was at Trinity College, Dublin, at Edinburgh, and at Louvain. For a time he assisted in a school kept by his brother, served as private tutor in Ireland, and was usher at Peckham Academy, so that his account of the humiliating position of the usher is based possibly on first-hand experience. It is in the same essay that he criticizes the declamatory style of educational writings and asks for a more scientific manner of presentation and for "didactic simplicity." Goldsmith attacks the numerous private boarding schools of the period. "Is any man unfit for any of the professions, he finds his last resource in setting up school," with no small profit to himself. The state should interfere and at least " cast its eye to their instructors," a suggestion which still remains to be put into effect in England. Better salaries are required to secure abler men for the teaching profession. The public schools are superior to private schools, for " it is not from their masters, but from their equals youth learn a knowledge of the world." Temperance and frugality, qualities which Goldsmith had negatively discovered to be desirable, should be taught in school, and moral tales should be introduced. Goldsmith further attacks the teaching of rhetoric and elocution, where conviction and a knowledge of the subject and language are of greater value. He was also opposed to the encyclopedic curriculum of his day, by which " the child soon becomes a talker in all and a master in none." Clearly something of " soft pedagogy " was already creeping into the schools, for Goldsmith mentions the futility of teaching language through textbooks with text on one side and literal translation on the other. Further, he says, " attempting to deceive children into instruction . . . is only deceiving ourselves, and I know no passion capable of conquering a child's natural laziness but fear." In another work (*Present State of Polite Learning*) the author discusses the relative merits of travel and study in college, and decides in favor of the latter for the young man. The universities he divides into three groups: those which retain the scholastic tradition,— Prague, Louvain, and Padua; those which do not prescribe the length of residence for a degree nor control the students,— Edinburgh, Göttingen, Leyden, Geneva; and those which have a prescribed period of study and some control,— Oxford, Cambridge, and Dublin. Dealing with the general characteristics of the universities he controverts the belief that they are places to advance learning, for " new improvements in learning are seldom adopted in colleges until admitted everywhere else. And this is right; we should always be cautious of teaching the rising generation uncertainties for truth." And lastly this modern touch may be added, " Learning is most advanced in populous cities, where chance often conspires with industry to promote it."

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IRVING, WASHINGTON. *Oliver Goldsmith*.

GOLDTHWAITE, WILLIAM C. (1816–1882). — Educational author, educated in the public schools of Massachusetts and at Amherst College. He was engaged in secondary school work in Virginia and New Jersey for a number of years and was principal of the academy at Westfield, Mass., from 1844 to 1868. He was one of the founders and editors of the *Massachusetts Teacher*, and the author of geographical textbooks. W. S. M.

GOLIARDS. — The name of a class of wandering students of the middle ages. They were drawn from the clerical orders and consisted of those who had no cure or office. The term is derived, according to Wright, from *gula*, and refers to their gluttonous and intemperate habits. They wandered from university to university as hangers-on of the higher clergy, or from one court to another, and led a riotous existence, living generally from hand to mouth. The bond which bound those who adopted this form of life together into a sort of fraternity was adherence to a mythical patron, Golias or Golias the Bishop, referred to also as *primas* and *archipoeta*. In his name and in his honor were perpetrated all the vices and pleasures which were incidental to a tramp life. To him were dedicated all the songs and literature which originated with this class, and under his patronage were made all the attacks against ecclesiastical authority and everything that was considered sacred; as, for example, the *Apocalypse Goliæ*, a parody on the Apocalypse of St. John. The songs have been collected and published under the title of *Carmina Burana* (*q.v.*).

See BACCHANTS.

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GONZAGA COLLEGE, SPOKANE, WASH. — See JESUS, SOCIETY OF EDUCATIONAL WORK OF.

GONZAGA COLLEGE, WASHINGTON, D.C. — See JESUS, SOCIETY OF EDUCATIONAL WORK OF.

GOODNOW, ISAAC T. (1814–1894). — A pioneer of the common-school movement in Kansas; was educated at the Wesleyan academy at Wilbraham, Mass., and was engaged in secondary school work first in Massachusetts, Maine, and Rhode Island, and later in Kansas. He was president of Bluemont College from 1856 to 1863 and state superintendent of Kansas from 1863 to 1867. W. S. M.

GOODRICH, CHAUNCEY ALLEN (1790–1860). — Lexicographer; graduated from Yale College in 1810. He was tutor at Yale from 1812 to 1814 and professor from 1817 to 1839.

He was the author of several Greek and Latin textbooks; edited the *Quarterly Spectator*, and brought out numerous revised editions of the dictionary of his father-in-law, Noah Webster (*q.v.*). W. S. M.

GOODRICH, SAMUEL GRISWOLD (1793–1860). — Author of the Peter Parley books, published eighty-four textbooks and reading books for children. His textbooks include, besides readers and primers, histories, geographies, spelling books, and science books. W. S. M.

GORDON, ROBERT (1668–1731).—Founder of Robert Gordon's College, an institution for the education of boys in Aberdeen, Scotland; was born in 1668 and died in 1731. For many years he carried on business as a merchant in Dantzig and amassed considerable wealth. On his death, he left his fortune in trust to the magistrates and ministers of Aberdeen for " the building of an Hospital and for the maintenance and education of boys whose parents are poor and indigent and not able to maintain them at school, and to put them to trades and employments." The erection of the Hospital buildings was begun soon after the testator's death, but it was not until 1750 that the school was formally opened with fourteen boys, under the mastership of a Robert Abercrombie, minister at Fortdee. From its foundation down to 1881, the institution was conducted on the basis of the original foundation as a hospital or boarding school for the sons of indigent burgesses. In the latter year, acting under powers conferred by the Endowed Institutions (Scotland Act), it was agreed to convert the Hospital School into a college or day school in which the chief subjects of instruction should be the English language and literature, history and geography, modern languages, mathematics, and the elements of physical and natural science. Provision was also made for the establishment of evening classes for youths and adults. The institution was hereafter designated as " Robert Gordon's College in Aberdeen." Quite recently, in 1910, the Constitution of the College has again been changed, and, in the future, Robert Gordon's College will become an integral part of the Aberdeen and North of Scotland Technical College, an institution designed to provide higher technical education for the North of Scotland, similar to that provided in the Glasgow and West of Scotland Technical College and in the Edinburgh Heriot-Watt Technical College. A. D.

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GORDON COMPREHENSIVE METHOD. — See Reading.

GORDY, J. P. (1851–1908). — Educational writer and professor, educated in the western University of Pennsylvania and the University of Leipzig. He was professor of the history of education in the Ohio State University (1886–1900) and New York University (1901–1908). Author of *Growth and Development of the Normal School Idea in the United States; Education in the Elementary School;* and *Textbook on Psychology.* W. S. M.

GORHAM, JOHN (1793–1829). — Author of textbooks in chemistry and physics; was educated at Harvard College and the University of Edinburgh and was professor at Harvard. W. S. M.

GOTHA, SCHOOL REFORM IN. — The small state of Saxe-Gotha, situated almost in the center of Germany, holds a position in the history of education which is almost unique. The earliest record of a school in the duchy is in 1299 when reference is made to a school in connection with the church in the town of Gotha. In 1327 two schools are mentioned, and a few years later a school of girls is referred to. Considerable activity was shown during the period of the Reformation. Myconius, a friend of Luther, became pastor and superintendent in Gotha in 1524. Influenced by Luther's *Letters to Councilors* and the *Letters to Pastors*, Myconius attempted to introduce some form of elementary education. The elements of a system are found in the instruction in reading which the pastors and sextons were ordered to give on Sundays. This lasted until the Thirty Years' War, when the small duchy was reduced to poverty and chaos like so many of her neighbors. But from this state of depression Gotha was raised through the efforts of a ruler whose interest in the welfare and education of his people placed him in the forefront. With a firm belief in education imbibed from his mother, Dorothea Maria, pupil and patron of Ratke (*q.v.*), Duke Ernest the Pious recognized that this was the only means for the regeneration of his country. Already in 1640 he ordered a school and church visitation to gather information as a basis for further action. He himself made some visits personally. For the reform of schools and the establishment of a system of education he summoned to his aid Andreas Reyher (*q.v.*) who had been a member of the philosophical faculty at Leipzig, rector of a gymnasium, and author of several school texts. Reyher was appointed rector of the gymnasium at Gotha in 1640. He was abreast of the best educational thought of his day, and was acquainted with the work of Alsted, Ratke, and Comenius (*q.v.*). The Duke commissioned him to draw up a *Methodus docendi* primarily for lower forms of the gymnasium, but useful also for other schools of the state. The result was the *Schulmethodus* (*School Method or Special and particular report, stating how, under the* *protection of the Lord, the boys and girls of villages, and the children belonging to the lower class of the population of towns, of this principality of Gotha can and shall be plainly and successfully taught. Written by the order of his Grace the Prince and printed in Gotha by Peter Schmieden in the year* 1642). This work, which was carefully revised by the Duke, appeared in 1642 and again in 1648, 1658, 1662, and 1672. Attendance at school was made compulsory on pain of a fine not only for absence but for tardiness. The teachers were ordered to be humane, and to avoid abuse and severity. A fully prescribed time-table was issued. The chief stress was laid on religious instruction, and the teachers were to avoid mere memory drill. Writing, spelling, reading, and arithmetic became regular subjects for the elementary school. The most remarkable addition was the study of natural and other useful sciences, including mensuration and surveying for boys, natural phenomena, geography, zoölogy; information was to be given on all natural objects in the neighborhood. "Everything that can be shown to children should be shown." The oldest children were to be taught civics, something about the government of the state and the importance of education. An annual examination was to be held at which the superintendent was to examine the records of the previous year and compare with the progress made at the time of the examination.

Twenty model schools were established, new inspectors were appointed, better teachers were secured, textbooks were written and distributed gratis to school children. Among the textbooks which were written by Reyher may be mentioned the *Deutsch A B C- und Syllabenbüchlein für die Kinder im Fürstenthumb Gotha* (*The German Hornbook and Speller for Children in the Principality of Gotha*) 1641; *Teutsche Lesebüchlein* (*German Reader*) 1642; *Arithmetica,* and in 1656 the *Kurtzer Unterricht* (*Short Instruction in natural objects, in some useful sciences, in ecclesiastical and secular institutions of the country and in some domestic rescripts*). For the training of children in manners a *Short instruction on the behavior of children* was published in 1654 on conduct of children on rising, dressing, at meals, at school and church, at play, and among strangers. The teachers were advised to study by themselves or with pastors and inspectors. Their salaries were raised; a sick fund was established, and some provision was made for the maintenance of teachers' widows and orphans. Although he realized the importance of training teachers, Duke Ernest could only charge his successors with the duty, since his own means would not permit the establishment of a system in his own day.

But reforms were not confined to the elementary schools alone. Under Reyher the gymnasium at Gotha gained a great reputation, and pupils were drawn from the noble classes from all parts of Europe. The number of classes was increased, and special attention was paid to the preparation of the older scholars for the university. The Duke frequently visited the school and took a special interest in the conduct of the pupils. Many of these proceeded to Jena, but, while the influence of the Duke was limited in this university, he issued a regulation in 1657 for those of his own subjects who attended there, dealing with the aim of studies, the means to this end, and the distribution of time. For the education of his own children, of whom he had eighteen, he drew up a rigorous regulation dealing with every hour of the day.

But such a system could only last so long as he who inspired it lived. The "Prince among educators and educator among Princes" died in 1675 and had already been preceded by his able assistant, Reyher, in 1673. From that date until the middle of the last century the educational history of Gotha is one of continued decline, due in some measure to the fact that the duchy was divided among the sons of Duke Ernest, and largely to the extravagance of the petty rulers who spent the country's wealth in cheap imitations of the Court of Versailles. The decline was arrested for a brief period under Ernest the Wise (1772–1804), who, assisted by Haun, inaugurated a reform of the decayed schools of the state; teachers were trained, schools were inspected, harsh discipline was stopped, the appointment of old servants to schools was checked, better methods of teaching were introduced by the issue in 1801 by Haun of *The common school methodus or practical instruction for inspectors and teachers of every kind of elementary schools, also for private teachers, illustrated by correct tables constructed by J. E. Christian Haun.* But the party of reaction again seized control on the death of Duke Ernest the Wise, and a real and lasting reform was not introduced until 1863, on the basis of which a system has been evolved which places the small duchy of Gotha among the leaders in the German educational system. See ERNEST I, THE PIOUS; ERNEST II.

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GOTHENBURG, UNIVERSITY OF, SWEDEN. — An institution founded in 1887 and opened in 1891 as a result of municipal aid and private beneficence. Lectures and courses had been organized in the town since 1841 under the auspices of the Royal Society for Science and Literature, and these had been subsidized by the municipal authorities since 1874. The university at present has only the faculty of arts. Although it is not a state university, the professors at Gothenburg must be approved on appointment by the King, and since 1909, when the institution received permission to conduct certain examinations, it has been placed under the authority of the Chancellor of the State Universities. In 1910 there was an enrollment of 166 matriculated students and 41 auditors.

Reference: —

Minerva, Handbuch der gelehrten Welt, Vol. I. (Strassburg, 1911.)

GÖTTINGEN, THE ROYAL GEORGE AUGUSTUS UNIVERSITY OF. — Founded by King George II of England, in his capacity as Elector of Hanover, the opening of the institution being celebrated with great ceremony in 1737, although instruction had actually begun three years prior to this date. The university forged to the front rapidly, and is to this day one of the most renowned of the German institutions of higher learning, having attracted a large number of English and American students, among the latter being Emerson, Longfellow, Bancroft, and Motley. Benjamin Franklin paid a visit to the university as early as 1766, and was made a member of the Royal Society of Science.

The university in its beginnings differed from those established during the second half of the sixteenth and during the seventeenth century in that the theological (Protestant) faculty was not emphasized to the detriment of the others, the healthy early development of the institution being attributable in large measure to the excellent administration of the Hanoverian minister, Von Münchhausen (until 1771). During the years of storm and stress at the beginning of the nineteenth century, Göttingen was included for six years in the Kingdom of Westphalia, but after the War of Liberation it was reunited to Hanover, which had been raised to the rank of a kingdom. A new era of prosperity was now ushered in, which unfortunately received a severe setback as a result of the dismissal in 1837 of seven of the most celebrated teachers of the university who had opposed the government in the constitutional conflict, the number including Jakob and Wilhelm Grimm and the historians Dahlmann and Gervinus. In 1866 Göttingen became a Prussian institution, but its loss of independence — it had been the sole Hanoverian university — was by no means accompanied by a decline in efficiency, as the Prussian Ministry has always evinced a warm interest in the institution, which has been manifested in recent years by the erection of a number of splendid medical institutes.

The faculty of philosophy is by far the largest branch of the university, and includes the oldest philological seminar in Germany, as well as a picture gallery and a collection of engravings as adjuncts of the work in the history of art. The anatomical institute contains Blumenbach's famous collection of skulls. Considerable emphasis has been and is still laid at Göttingen upon the subject of mathematics, while the departments of physics and physical chemistry are also widely known. The university library, an important collection from the very first, contains over 550,000 volumes and almost 7000 manuscripts, it being the largest university library in Germany. The university also contains a riding academy and a swimming pool. A German institute for foreign students, the Böttinger Studienhaus, established by an Elberfeld merchant in 1909, was transferred to the university of Berlin (1911). The annual budget of the university amounts to about $400,000. The town is also the headquarters of a famous Royal Society of Science (*Gesellschaft der Wissenschaften* — 1751, 1893), and contains a professional school for *Feinmechanik.*

In addition to the scholars referred to above, mention may be made of Albrecht von Haller in science, Heyne in philology, Wilhelm Weber in physics, Wöhler in chemistry, Gauss in mathematics, Curtius, Waitz, and Roscher in history,. Jhering and Planck in jurisprudence, and more recently Moritz Heyne in Germanic philology. Heinrich Heine was a student at Göttingen from 1820 to 1821, Bismarck from 1832 to 1833.

During the winter semester of 1909–1910 Göttingen ranked seventh in point of attendance among the German universities, enrolling 2342 students (217 women), of whom 112 (57 women) were auditors. As at a number of other German universities, there are more students (1419) enrolled in the faculty of philosophy than in all of the others combined, including the great majority of matriculated women. The law faculty, which enjoys a high reputation, also has a large attendance (432), the school of medicine attracting 262 students and that of theology 117. In the winter semester of 1910 there were 2233 students in attendance. R. T., Jr.

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Pütter, J. St. *Versuch einer akademischen Gelehrten-Geschichte von der Georg-Augustus-Universität zu Göttingen.* (Göttingen, 1765–1838.)
Rossler, E. F. *Die Gründung der Universität Göttingen.* (Göttingen, 1855.)

GOUCHER COLLEGE, BALTIMORE, MD. — An institution for the higher education of women, founded in 1884 by the Baltimore Conference of the Methodist Episcopal Church as the Woman's College of Baltimore. The college was opened in 1888. The present name was adopted in 1910. The entrance requirements are fifteen units of high school work, and the A.B. degree is conferred at the end of a four-years course, consisting of certain required and elective subjects, with a major in one department. In coöperation with Johns

Hopkins University a College Course for Teachers is conducted by the faculties of both institutions; women students satisfying the requirements of these courses are admitted to the A.B. degree of Goucher College. The number of students enrolled in 1909–1910 was 367. There were thirty-three members on the instructing staff.

GOUGE, THOMAS (1609–1681). — Dissenting minister and philanthropist, educated at Eton and Cambridge. Until the Uniformity Act of 1662 he held a living in London, in which he conducted catechetical classes and employed the poor in spinning flax and hemp, a type of poor relief taken up on a wide scale by his friend Firmin (*q.v.*). Gouge's most important work, however, was the evangelization of Wales, which he undertook in 1672. He established schools, and employed teachers to give instruction in English and the catechism. Ultimately about three hundred schools were established. In addition he also distributed, mainly at his own expense, religious literature. In 1674 a trust for this purpose was established, including eminent churchmen and dissenters, and the Bible, Book of Common Prayer, Church Catechism, and other works were made accessible to the Welsh either through free distribution or at a very low price. So far as Gouge's schools are concerned, it would seem from Strype's evidence that they continued after his death until the Society for the Promotion of Christian Knowledge (*q.v.*) became active in Wales (1730). Gouge, probably through the influence of Firmin, a governor of the institution, also devoted himself to catechizing the scholars of Christ's Hospital.

See Charity Schools.

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GOULD, BENJAMIN APTHORP (1787–1859). — The author of a series of Latin textbooks, was educated at Harvard and was headmaster of the Boston Latin School from 1814 to 1829. W. S. M.

GOVERNMENT AID. — See England, Education in; National Government and Education.

GOVERNMENT OF CHILDREN. — See Rewards and Punishments; School Management.

GOVERNMENT, SCHOOL. — See School Management.

GOVERNMENT, SELF, IN SCHOOL. — See Self-Government of Pupils; School Management.

GOVERNMENTAL PUBLICATIONS ON EDUCATION. — See Official Publications; and articles on National Systems of Education.

GOVERNORS, BOARDS OF. — See Boards of Control.

GOWNS. — See Academic Costume.

GRACE. — A term which originally meant a dispensation granted by a university or some faculty in it from the "elaborate and complicated regulations" required from candidates for degrees. In the early period few candidates required "graces," but by the fifteenth century the "grace" was asked for as a regular practice. At Oxford it was granted by the Congregation of Regents. Conditions were frequently imposed on the granting of graces involving the performance of some action or a contribution for some purpose, charitable or otherwise. Later a grace came to mean any decree of a university which involved a dispensation from statutory requirements. The term is still used in this sense of decrees of the Senate at Cambridge. A further use of the word is with reference to the permission given by a college or hall for one of its members to take a degree.

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Rashdall, H. *Universities of Europe in the Middle Ages.* (Oxford, 1895.)

Wells, J. *The Oxford Degree Ceremony.* (Oxford, 1906.)

GRACELAND COLLEGE, LAMONI, IA. — A coeducational institution opened in 1895 under the auspices of the Reorganized Church of Jesus Christ of Latter Day Saints. Preparatory, collegiate, normal, commercial, music, and oratory departments are maintained. An industrial department is provided to enable students to defray part of their expenses. The entrance requirements are equivalent to twelve units of high school work. The degrees of A.B. and B.S. are conferred on completion of the requirements. There is a faculty of thirteen members.

GRADATION; GRADES; GRADED SCHOOLS. — See Grading and Promotion.

GRADE GROUP PLAN. — See Grading and Promotion.

GRADE MEETINGS. — Teachers in service are given instruction through teachers' meetings variously composed. When the basis of determining the attendance is the grade or grades taught by the teachers, the name "grade meeting" is applied. Thus, there are first grade meetings, third and fourth grade meetings, or grammar grade meetings. H. S.

See Supervision of Teaching; Teachers in Service, Training of.

GRADING AND PROMOTION. — As school systems become organized, the necessity of teaching children in groups composed of those of substantially equal attainments produces the graded system or graded school. An ideal system of grades presupposes that all the children in a given group shall be about the same age and of equal capacity for school work. A system of grading or classification or grouping by classes begins with the entrance into school of a large number of children not yet trained in school subjects. Those who advance regularly through a course of study have their progress marked at certain intervals by promotion, which is essentially a stage when reclassification seems desirable. Naturally the course of study is the foundation of grading. This program of work and of standards to be reached indicates divisions appropriate to each year or other interval. The course of study may be so framed at any given stage as to be capable of mastery by a large or small proportion of the children. It may lay stress on formal elements of subjects in which special details may be placed at a premium, thus resulting in the failure of a considerable number of ungifted children.

At any stage the object of a system of grading is to produce groups or classes that are fairly homogeneous as regards attainments at the moment, and also capacity to make a certain rate of progress throughout the course of study as organized. Grading and promotion thus come to be focusing points of a variety of problems growing out of the teaching of children in groups. Mechanization of school work first expresses itself in an inflexibility of grading and in a rigidity of promotion from one stage to another in the course of study.

The first fact to be noted is that the homogeneousness of any group of children can be approximate only. Children of the same age not only differ among themselves as regards attainments in general, but also vary largely according to the particular type of attainment considered; for example, of two children A may be inferior to B in arithmetic, but superior to B in music. Furthermore, children of substantially equal attainments at a given time may differ considerably as regards their rate of learning the subject matter. The rate commonly employed in practice is that which has been determined by experience as one suitable to a majority of normal children. Manifestly such a rate must fail to take account of individuals who differ considerably from the normal. In general, consideration of the individual pupil tends to produce criticism of the graded system, because in any such system it will be found that not only are numerous individuals quite unsuited to its requirements, but that every individual at some point loses in opportunities because of the system employed. On the other hand it must be recognized that a system of grading is a necessary measure of economy wherever children must be dealt with in large numbers.

Starting with the assumption that some system of grading is necessary and that the end of a system of grading is to produce groups so homogeneous as to make the maximum progress of all the individuals composing the group possible, the various attempts to modify the effects of its too great mechanization may be discussed. If, from a large number of children, there be removed the comparatively small number of individuals who vary greatly from the normal, there is a system of grading and promotion supplemented by the existence of special classes (*q.v.*), into which might be put those who by reason of excessive age are ill adapted to given grades; or those who, having deficient sense organs or being weak mentally, are manifestly incapable of keeping pace with any group of normal children. This removes from the grades the strongly marked variant cases, and gives the teacher opportunity to devote her efforts to a class more nearly homogeneous. Similarly such pupils as may retard the work of a class through increasing the difficulties of discipline may be put into special disciplinary classes (*q.v.*).

Even among fairly normal children it is found that not all can make the same rate of progress. Where a pupil is so obviously unable to maintain progress in his grade, without being in any sense defective, he may be transferred to a grade lower than his own. (See Demotion.) A system of grading has been devised whereby groups shall proceed, as it were, along parallel lines. This is sometimes known as the Cambridge system, and may be so systematized that a given course of study shall be completed in respectively seven, eight, or nine years, so far as given individuals are concerned. Fully carried out, this system not only provides for pupils who are persistently unequal in their ability to make progress, but also for those who at one stage of their school career may proceed rapidly and at another slowly. In large schools it is possible to still further extend the principle involved in the Cambridge system. Under close oversight of principal and teacher, pupils may be formed into groups as nearly homogeneous as possible, and the rate of progress may then be determined without reference to any fixed program, but with reference solely to the capacity of the group. The system has been made so elastic that individuals may be frequently shifted from one group to the other, according as they manifest capacity to proceed more rapidly or to require more time. This is sometimes referred to as the group system, and provides the maximum degree of elasticity in this direction. In a few instances it has been carried so far as to allow for a measurable shifting of pupils from group to group according as different subjects are being taken; but this requires extremely close supervision, and is possible only in a school of very large size. Such classification or grading pupils by subjects is an arrangement which is more possible in schools with the departmental system (*q.v.*) than in others. Not only is such a system an element in flexible grading, but in the later years it makes articulation with the high school possible.

Flexibility of grading is sometimes attained by varying the demands made upon pupils for amount of acquisition in any given grade. This takes several forms. The class may be carried over a given section of the course of study at such a rate as to allow the more capable pupils to meet all the requirements, but the less capable to require a review. The first group may then be promoted, or, more commonly, may take additional work in the ground covered, while those less capable are acquiring necessary proficiency in the essential subjects. A more extended form is found where two groups of pupils are carried along side by side, the one containing the more capable, the other the less, the latter being required to take only the minimum amount of work and to reach the minimum standard required for promotion, while the former takes an enriched course of study, not necessarily advancing them in the essential branches. Both divisions are expected to cover substantially the same ground in the subjects essential to promotion. A further modification of this plan rests on a differentiation of teaching. It is sometimes known as the Batavia plan (*q.v.*), involving two teachers in a room, the first of whom gives mainly class instruction, while the second coaches individuals who need additional assistance in order to make the required rate of progress. A plan which is very similar is the division of a class into two groups, each alternately receiving the attention of the teacher, so that while one group is studying, the other is reciting. (See ALTERNATING SYSTEM.)

All these systems are yet more or less in the experimental stage, and some of them involve administrative difficulties which can be met only in exceptional situations. It is evident, however, that all of them constitute important attempts to produce a system, which, while utilizing the economies and efficiency that result from a training of children in homogeneous groups, shall nevertheless have due regard to the individual in respect to those points at which his interest demands some variation from the standards imposed upon the group.

It should be noted that a few educators believe that a radically different system of grouping children may eventually prove more satisfactory. Instead of a homogeneous group, the late Professor Jackman of Chicago University believed that a group heterogeneous so far as the years and attainments of individuals were concerned could yet be formed into an organic unity which would result in the maximum opportunities for progress of the individuals composing it. From his point of view a system of training based largely on activities would find in a given group old and young children, some bright and some dull, but each carrying on learning activities in conjunction with others in such a way as to finally attain a maximum result. This system of classification would naturally require the elaboration of pedagogical theories which are yet very hypothetical.

The passage from one grade to another in a systematized course of study is commonly called promotion. The failure of a child to pass this stage gives the phenomenon of retardation (*q.v.*), which is by some assumed to be an index of the efficiency of the results of teaching. In the search for incentives among school children, promotion and non-promotion are often utilized as sources of motive. The fear of non-promotion among some children can be the most powerful incentive to exertion, while with others who are inclined to be mischievous it may serve as an excellent deterrent to insure good conduct. At certain stages in the educational career of youths where promotion means advancement into other types of schools or into other types of opportunity, the event becomes comparable in its importance to the ceremony of initiation in primitive life. The ability of the German boy to pass the imperial examination, which entitles him to exemption from compulsory military service and barrack life, becomes an important factor in the social standing of the youth and his family.

Tests for promotion from one grade to another become important features not only in the administration of schools, but in determining fundamental characteristics in the course of study itself. A highly mechanical system tends to introduce external examinations as a basis for promotion and graduation. A system in which the teachers must be stimulated by external aids makes free use of written examinations. These developments were best exemplified in the English practice during the period of the so-called "payment by results" plan and in American cities during the period from 1870 to 1895. Even slight consideration will show that a system of written examinations will test certain forms of learning only, and will quite fail to test others. Where written examinations prevail, subjects susceptible to this form of test will be at a premium. Present American practice, however, tends not only toward flexible grading, but toward flexibility in the conditions for promotion. The teacher's judgment of the pupil's ability to proceed enters as a factor, as do also formal records made of a term's work. (See EXAMINATIONS.)

In secondary schools there is an increasing tendency to grade the pupil on his ability in an individual subject rather than in all subjects taken together. Promotion by subject then comes to be the rule, and graduation is possible when a definite number of units have been reached.

The future development of grading and promotion will rest more largely than in the past on a study of the needs and possibilities of children. The study of retardation (*q.v.*) is serving to analyze the causes of the non-promotion of children. Some of these causes are found in the course of study itself, some in matters like illness and irregular attendance, over which the school may have little control, and some in a failure to reach the individual as far as possible by more scientific grading. It is possible that future developments will show that certain of the subjects recognized in a course of study are of such a nature that definite stages of attainment or power not only can, but must, be recognized as a basis of grouping; whereas other subjects have only a secondary bearing on the ability of the child to work in one group rather than in another. This differentiation may indeed rest, to a certain extent, on the social importance of the subjects. For example, arithmetic is a subject lending itself easily to a graduated statement, and is also sufficiently important to be imposed as a condition of promotion. Nature study, on the other hand, is not easily graded, and its importance may be such as to make it a matter of indifference whether the pupil has completed it or not when the question of promotion is being considered. In some school systems a deliberate differentiation is now being made between "essential" and "additional" subjects, the former only being considered in connection with questions of promotion.

The operation of a flexible system of grading as described above will be affected by conclusions yet to be reached as to the number of different groups of pupils which a teacher in a given room may handle to advantage. Practice in many places now assumes that a grade to a room is the desirable condition. It is not clear, however, but that a more effective mastery of the art of teaching might not enable a teacher to carry at least two different grades or groups along side by side, with the maximum advantage to all concerned. D. S.

See Grading, Hygiene of; Retardation, Elimination and Acceleration of Pupils.

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GRADING BY PROMOTION. -- See Grading and Promotion.

GRADING, FLEXIBLE. — See Grading and Promotion.

GRADING, HYGIENE OF. — Modern investigations have revolutionized the problem of grading. With the older pedagogy it was a relatively simple thing to classify pupils merely according to their scholastic attainments. Now many other factors must be considered, — physiological age, psychological age, ability to work and to resist fatigue, general physical condition, mental type as regards imagery, attention, and the like. Hence to-day the problem of grading is quite as much an hygienic as a pedagogical one.

Roberts, the English anthropologist, was one of the first to put special emphasis on the need of considering physical development in allotting pupils to the different grades. He made out a table giving the statures and weights of boys at different ages and the amount of time that should be allotted for study and sleep and rest; and he maintained that age alone is not sufficient to determine a child's position in such a table, that "A child who is much below the mean height and weight of his age should be placed a year below, and one who is a good deal above the mean, especially if the weight be good, may be advanced a year above that which his actual age requires," and that the same principles should be considered in the grading of girls as in the grading of boys. Dr. Brahn and others have maintained that children should be graded according to their ability to work and to resist fatigue. Recently a demand for more than this has arisen. The studies by Crampton and others have shown the hygienic necessity of considering physiological age in all questions of grading and the like. His study was based on investigations of high school students, and his general conclusion was that, "In future all our thought concerning the years nine to seventeen must be released from the idea of chronological age. Statistics for groups or individuals respecting weight, height, strength, scholarship, mental or physical endurance, medical or social conditions, that are not referred to physiological age are inconsequential and misleading."

Dr. Crampton's investigations were based on actual physical examinations. Sometimes under present conditions this is not practicable, and in lieu of this Mr. Foster maintains that height is a good index of physiological age, and the investigations by Quirsfeld support this view. Professor Rotch of Harvard strongly maintains that the appearance and ossification of the epiphyses of the wrist and fingers are a trustworthy index of the general osseous development, and this in turn of general physiological development. Hence he takes X-ray photographs of these bones, and determines physiological age from them. He distinguishes chronological age, anatomical age, physiological age, and functional cerebral age, and maintains that the normal correspondence of all these ages should be the standard for grading children, and that any other method of grouping is unpractical and illusive. There is at present no consensus in regard to what is the best method of determining physiological age. More studies of this problem are greatly needed.

Psychological age also must of course be considered. But though tests of psychological ability and maturity have been advocated, none altogether satisfactory have yet been devised. The most important practical attempts have been in the use of mental tests, particularly the Binet tests, for detecting cases of arrested mental development. While idiots are not likely to be found in the public schools, imbeciles and feeble-minded of the higher grade, the so-called morons, are not infrequently found. The importance of detecting such cases has been vividly shown by Dr. Goddard, and further investigations and the perfection of such tests is greatly needed.

The public school must provide for three main classes of pupils, — the normal child of good ability, including the supernormal, on the one hand, the defective children on the other, including those mentally and physically deficient, and between these two groups the large class of children who are more or less backward from various causes. All these cases will be found discussed under the separate titles as: BACKWARD PUPILS; BLIND, EDUCATION OF THE; CRIPPLED CHILDREN, EDUCATION OF THE; DEAF, EDUCATION OF THE; DEAF-BLIND, EDUCATION OF THE; DEFECTIVES, SCHOOLS FOR; EXCEPTIONAL CHILDREN; NERVOUS CHILDREN, EDUCATION OF; OPEN-AIR SCHOOL; RETARDATION AND ELIMINATION OF PUPILS; SPEECH DEFECTS, EDUCATIONAL TREATMENT OF; SPECIAL CLASSES; SUPERNORMAL CHILDREN; TUBERCULOUS CHILDREN, EDUCATION OF; etc.

Many special plans have been adopted. The plan which has received the widest attention, and which in a general way illustrates the principle upon which there is now a consensus, is the system of grading that has been used for many years in the schools of Mannheim in Germany. The main features of it are as follows, there is the ordinary school course of eight years, and besides the course for defectives, *Hilfsschulen*, such as are found in many German cities, with a four years' course, and between the ordinary course and the *Hilfsschulen* a course of six years which covers the same ground as the ordinary school course, but has to do less with details, has smaller classes, and specially equipped teachers. Transfer from the shorter course to the fuller course or the reverse is easy at the end of each year. (See GERMANY, EDUCATION IN.) There have been many criticisms of this Mannheim system; but some plan of this kind is obviously necessary, and such a system seems to come nearer than any other which has been tried to meeting the demands upon which there is a consensus. This will not, however, solve the deeper problems of grading. While, if the plan is carried out with the coöperation of a school physician, as Dr. Moses maintains is always necessary, physical conditions will be regarded in the grading, nevertheless much more than this is desirable and some plan of grading that shall be based upon classification according to physiological age and ability scientifically determined must be devised.

While there is at present no consensus in regard to the methods of determining such development, the announcement of the principle is an important contribution. Grading merely according to scholastic attainments and chronological age can no longer suffice. Even pedagogical efficiency demands more than this. From the point of view of hygiene it is imperative that both in the vertical and the horizontal grading regard should be had for the physical condition and the stage of development. Modern studies have shown that from a third to one half of the children in any school are likely to be physically defective or suffering from chronic disease. Serious results are likely to follow when the weak and defective are required to do what the strong ought to do. Some of the normal have much greater endurance than others; some of them belong to one mental type, others to different types; and besides all this there are great individual differences. If we are to make any pretense to scientific pedagogy, to say nothing of hygiene, we must consider these facts and have a thoroughly different plan of grading based upon physiological and psychological age as well as scholastic attainments. W. H. B.

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GRADUATE SCHOOLS; GRADUATE STUDY. — See Universities.

GRADUATE WORK. — A term commonly used in America to indicate work done in the combined university-college institutions beyond the bachelor's degree; in other words, university work as opposed to collegiate work.

See Universities, American.

GRADUATION. — See College, American, section on Length of College Course; Commencement; Degrees, also Graduation, Age of; Grading and Promotion; Universities.

GRADUATION, AGE OF, FROM AMERICAN COLLEGES. — The question of age of graduation from college has constituted an important factor in the discussion of many college problems of the present. It has been popularly supposed that the age of graduation from colleges had gradually risen from generation to generation, and that the typical college student of the present is more mature than in the past; consequently that the college course of the present together with its administration might and should be a very different thing from that of the past and that the relation of college course to secondary school on the one hand and to the professional school on the other should be determined altogether irrespective of past conditions. The further assumption was that such relationships were not so determined, and that existing problems (see Problems of the College, under College, American) were thus created.

The accurate investigations into the facts do not reveal grounds for this general assumption. On the contrary, while there is a certain conflict of tendencies in different institutions, the slight preponderance of the tendency is toward a decrease of age rather than an increase. The most extensive investigation made was that by Professor W. S. Thomas, in 1903, involving eleven institutions and more than 20,000 students, and covering substantially the entire nineteenth century. The actual results of this investigation shown by ten-year periods is given in the following table:—

MEDIAN AGES OF GRADUATION BY DECADES

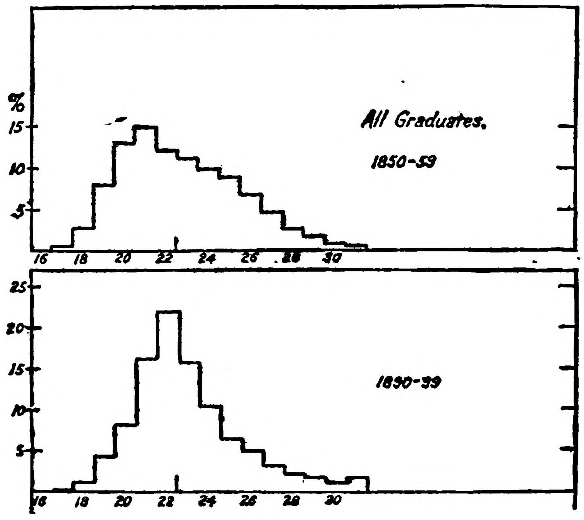
	Dartmouth		Middlebury		Bowdoin		University of Vermont		Adelbert	
	Age	No.	Age	No.	Age	No.	Age	No.	Age	No.
1770-1779	23- 0	78								
1780-1789	23- 1	150								
1790-1799	23- 2	336								
1800-1809	22- 6	323	22-10	76						
1810-1819	22- 9	330	23- 1	194	20- 4	106				
1820-1829	23- 1	328	23- 0	187	20- 8	258	22-4	59		
1830-1839	22- 5	384	23- 4	242	21- 7	289	22-7	80	23- 0	41
1840-1849	23- 1	586	22- 8	109	21- 9	356	22-0	184	23- 2	125
1850-1859	23- 8	558	23- 3	121	22- 1	335	22-4	168	23- 0	98
1860-1869	23- 1	491	23- 5	132	22-10	348	22-6	91	22-10	160
1870-1879	22-10	593	23- 4	111	22- 5	321	22-6	98	22- 9	217
1880-1889	22-10	527	22-11	86	22- 8	303	22-8	108	23- 0	251
1890-1899	22- 9	678	23- 2	125	22- 7	481	22-9	215	22- 9	156

	University of Alabama		New York University		Wesleyan		Oberlin		De Pauw		Syracuse	
	Age	No.	Age	No.	Age	No.	Age	No.	Age	No.	Age	No.
1830-1839	20-4	57	20-2	73	23-0	107	24-11	34				
1840-1849	20-3	126	20-3	147	23-3	231	25- 6	122	21-7	63		
1850-1859	20-9	173	20-7	102	23-4	231	25- 2	120	22-9	89	23-11	28
1860-1869	20-0	48	20-8	128	24-0	260	24- 0	176	23-2	115	24- 0	29
1870-1879	20-3	66	21-6	141	23-8	325	24- 3	270	23-1	230	24- 6	138
1880-1889	20-0	209	21-1	154	23-3	323	24- 3	267	23-2	317	23- 9	224
1890-1899	20-2	270	21-8	115	23-6	456	23-11	403	23-9	371	23-11	264

This table indicates that the median age for Dartmouth has fallen (three months in one hundred and thirty years); that for Middlebury has risen (two months in seventy years); for Bowdoin the median age has risen two years since 1810, but has been falling for the past sixty years. In only two of the eleven institutions, the University of Alabama and Syracuse University, has the median age remained unchanged. It is evident that, whether this slight change has been an increase or a decrease, it is chiefly a matter of the individual colleges.

An averaging of the median ages of the several colleges also shows that since 1850 there has been a gradual but slight decline in the age of graduation, amounting to two months in all. A study of the average ages of graduates instead of the median ages brings the same relative results, though the arithmetical average runs a few months higher throughout the entire period than does the median age. This is because the few students that are relatively much older than the average of the group, of whom every college has some, diverge much more from the median than do those below the median, and tend to bring up the average disproportionately. It is the gradual disappearance of this group of very mature students during the past half century that is tending to lower both median and average age of graduation.

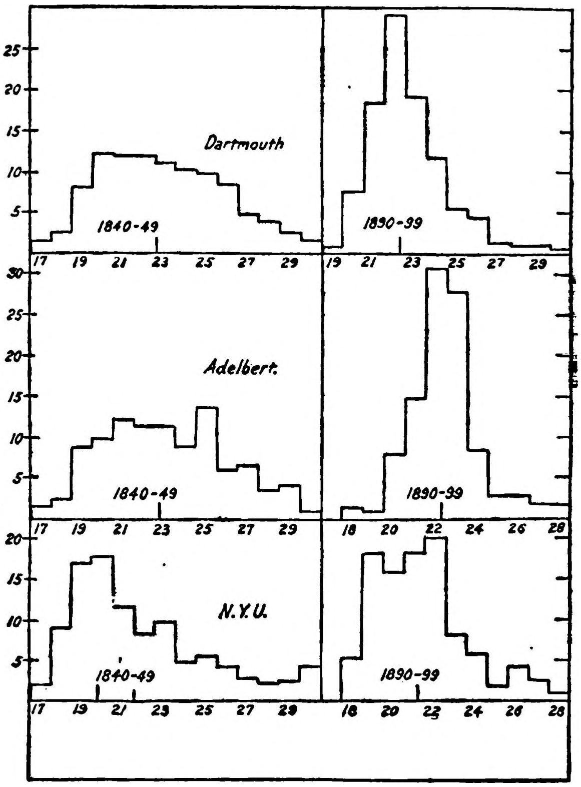
Of greater importance than the average or median age of graduation is the distribution of the graduates by years. A comparison of the aggregate of all graduates of these eleven colleges for the decade at the middle of the century with the decade at the close shows that not only the average and the median have remained practically the same, but that the distribution of the students is becoming far less wide. This is indicated by the following diagram, which gives the distribution of all students graduating in these eleven institutions for the two decades under consideration.



While the median age of graduation remains practically the same, 22 + years, the greater number are concentrated in the twenty-first, twenty-second, and twenty-third years. A further change is indicated by this diagram, which seems to bear out the old contention that the age of graduation was rising. The mode, indicating the year in which the greatest number of students graduated, falls in the first diagram in the twenty-first year, in the second in the twenty-second.

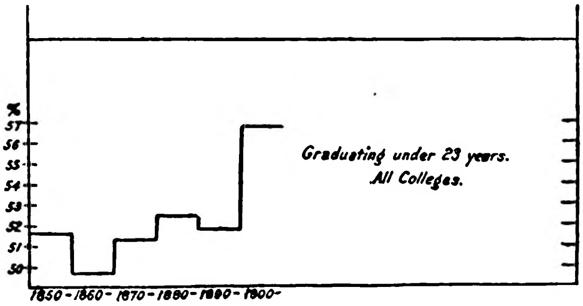
The significant fact which is indicated by this as well as by other data is that the student body is being unified and standardized as to age, as it never has been before, and that the entire group of college students is coming to be a body of young men between the ages of eighteen and twenty-three or twenty-four. The graduating body is largely concentrated in the years twenty-one to twenty-four.

The following chart giving the distribution for these colleges for the two decades, half a century apart, indicates this very definitely: —



The gradual disappearance of the very mature student accounts in a large measure for this aspect of the change. While the median age has remained approximately the same, the number graduating before the twenty-third year has greatly increased. The following chart shows this distribution for the past fifty years for the entire group of colleges studied.

The percentage of the graduates under twenty-three has risen from 50 to 57 per cent, indicating again that the impression, so generally held, that the age of graduation had increased was based on the extreme or isolated instances.



A more recent investigation by Professor George D. Strayer, based upon ninety-three selected colleges and covering the first decade of the present century, shows substantially the same conditions. The median ages of graduation for the middle 50 per cent of the colleges are included within the limits, 22 years and 6 months and 22 years and 9 months. For women the median age is 22 years and 8 months, the middle 50 per cent falling between the limits 22 years and 23 years and 3 months.

The investigations conducted each quinquennial period by the authorities of Harvard University into the age of the entering class support substantially the same results. The average age of the entering class was 18 years and 9 months in 1876, and from that time to 1900 gradually increased to 19 years and 4 months, since which time it has, with slight variations, gradually decreased.

In general we may say that the assumption that there has been a great advance in the average age of the college graduates was an error; that there are but few institutions where such an increase has occurred; that this is offset by a corresponding decrease in other institutions; and that the change either way for the larger part of the nineteenth century was very slight. What is occurring is the elimination of the very young students and the very mature, and the standardizing of the entire group.

As in the early part of the nineteenth century the curriculum itself had a fixed organization and the student body was much differentiated in age, the reverse comes to be true toward the close of the century: the curriculum loses its fixed character and becomes fluid, but the student body becomes standardized as to age and the college comes to take a very definite place in our system of education of four years in length following four years of high school or preparatory and eight years of elementary school work, and approximating the eighteen to twenty-two years of the student life.

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GRAFE, HEINRICH (1802–1868). — A German teacher and educational writer, born in Buttstädt in Thuringia. After studying mathematics, philosophy, and theology in the University of Jena (1820–1823), he first became a clergyman, then the principal of the city school at Jena. In 1840 he was appointed professor of pedagogy in the University of Jena, a position which two years later he changed for the principalship of a Realschule in Cassel. He took part in the political struggles of the year 1848, which caused his imprisonment, and afterwards forced him to flee to Switzerland. From there he was called as a principal to Bremen in 1855, and remained there until his death. His chief works are: *Allgemeine Pädagogik* (*General Pedagogy,* Leipzig, 1845), and *Die deutsche Volksschule* (*The German Public School,* Leipzig, 1847). F. M.

GRAMMAR, ENGLISH. — Historical Development. — The first work on this subject was actually written in Latin, viz. the *Grammatica Anglicana* by P. G., who is supposed to be a certain P. Greenwood, in 1594. It is a booklet, containing short chapters on letters, syllables, parts of speech. The book professes to deal especially with those points in which English differs from Latin grammar. It is of interest because it contains a vocabulary of Chaucerian words, together with their signification. There is also the first treatment of the parsing, or, as it is called, " analysis " of English. In 1624 John Hewes published *A Perfect Survey of the English Tongue.* He claims that his book serves for the exposition of Lily's Latin Grammar rules. The author endeavors to deal with English expressions, *a posteriori,* as the groundwork for the Latin. Hewes thus treats of moods, tenses, cases as found in English, and thus leads on to the Latin. Hewes was succeeded by William Walker (1623–1682), who follows the same method, but develops it more fully in his famous *Treatise of English Particles* (published before 1660). Walker expounds English particles as the preliminary to learning to write Latin composition. In 1633 Charles Butler wrote the *English Grammar,* a work which gives a real English accidence independent of Latin. It goes into questions of spelling and gathers from Sir John Prince the story of four good secretaries writing in English from dictation, making many differences of spelling, whereas four noblemen writing the same in their language all wrote exactly the same letters. Butler traces the uncertainty in English spelling to the imperfection of the alphabet. Both Butler and Gill utilize the Anglo-Saxon signs for the different sounds of *th.* In 1640 Simon Daines published a book, exactly described by the title: *Orthoepia Anglicana; or the first principall part of the English Grammar Teaching the Art of right speaking and pronouncing English, with certaine exact rules of Orthography, and rules of spelling or combining of syllables,* *and directions for keeping of stops or points between sentence and sentence. A work in itself absolute, and never known to be accomplished by any before: No lesse profitable than necessary for all sorts, as well Native as Foreigners, that desire to attaine the perfection of our English Tongue. Methodically composed by the industry and observation of Simon Daines, Schoolmaster of Hintlesham in Suffs. Lond.* 1640. The next English grammar was that "made" by Ben Jonson, the dramatist, "for the benefit of all strangers out of his observation of the English language how spoken and in use."

The grammar unfinished and not published until 1640, three years after Jonson's death, is accompanied with a Latin commentary. Jonson quotes first the older writers, *e.g.* Chaucer, Gower, Lydgate, Foxe, More, Ascham, Cheke, Jewel, so as to illustrate and authorize particular usages of grammar, and supplies items of historical treatment of syntax. In 1653 was published *A New English Grammar* by J. Wharton. This was professedly useful for scholars before entrance on the Latin tongue, and therefore starts a new period in the teaching of English. It was also devised, like Jonson's, for the use of strangers learning English. Wharton points out that English is "happy beyond both Latin and Greek," in that it "needeth little or no grammar at all." In the years 1711 and 1712 no less than three English grammars were published, viz. that of John Brightland (*q.v.*) and Michael Maittaire (*q.v.*) and that of James Greenwood (*Essay towards a Practical English Grammar*). These grammars provoked an attack by the anonymous writers of *Bellum Grammaticale,* consisting of reflections on the three English grammars "published in about a year last past" in 1712. In 1762 Robert Lowth, Bishop of London, published *A Short Introduction to English Grammar,* which strongly emphasizes the question of good use in grammar. This was a work of considerable merit, ran through many editions in England, and was republished at Cambridge, Mass., in 1811. Lowth's work was criticized by William Cobbett in his well-known *Grammar of the English Language* in a series of letters, 1818. Cobbett states that his *Grammar* was intended for the use of schools and of young persons, "but more especially for the use of soldiers, sailors, apprentices and plough-boys." But still more popular than Cobbett's book was the *English Grammar* of Lindley Murray (*q.v.*), published in England in 1795. Both in England and America this was for many years the chief, almost only, English grammar used, particularly in girls' schools, for which it was first written. It went through some fifty editions, and an abridgment, first published in 1818, reached over 120 editions of ten thousand each. (See *Dictionary of National Biography.*) The first writer of an Anglo-Saxon grammar was Elizabeth Elstob (*q.v.*), 1715. The pioneer in the school teaching of historical English grammar in England was Dr. Richard Morris, Headmaster from 1875 to 1888 of the Royal Masonic Institution for Boys at Wood Green near London. In 1872 he wrote his *Historical Outlines of English Accidence,* which went through twenty editions before his death, and, making the subject matter more and more elementary, he published in 1874 his *Elementary Lessons in Historical English Grammar,* and in the same year the *Primer of English Grammar.* F. W.

Grammatical Study. — The grammar of the vernacular has not usually been regarded as a subject for scientific consideration in itself, but the views which have been held with respect to it from time to time, and which have guided instruction in the subject and the composition of textbooks intended for use in instruction, when they have not been merely utilitarian, have been rather a reflection of the prevailing modes of philosophical or linguistic thought in general. Moreover, methods of instruction in English grammar, as exemplified in the textbooks, have been extremely traditional, and have followed a few established models, with the result that though the number of English grammars is legion, they have added relatively little to the development of serious and independent theory with respect to the subject.

Two schools of thought in especial have exerted a powerful influence upon the conception of grammar, first, the systematic philosophic thought of the eighteenth century, and secondly, the modern scientific thought, as exhibited mainly in the sciences of psychology and historical linguistics. The principal inheritance of grammar from philosophy is to be found in the grammatical definition. The conventional definition of the sentence, for example, or of the parts of speech, is based upon the assumption of a correspondence between the forms of speech and the categories of a formal logical system. A grammatical statement of a language, according to this conception, would consist of a statement of all the modes of thought possible in that language. Several important consequences and corollaries have followed from this *a priori,* logical way of regarding the classifications of grammar. In the first place, if there is one logical form of thought to which the forms of speech each respectively belong, manifestly there is one and only one possible definition of a grammatical group of phenomena, and this definition is absolute and right. There thus has arisen in grammar the feeling for the dogmatic character of the definition or rule, and the desire to make the phenomena of language conform forcibly to the rule if they seem to differ from it. So much the worse for the language, says in effect the logical grammarian, if it does not conform to the fundamental laws of the mind. This has been the main defect of the logical method in grammar, that it has preferred a specious appearance of regularity and system to the actual variety and unsystematic wealth of detail of real speech. The forms of speech do not fall into simple categories, but, as observation quickly shows, they overlap and often shift their functions in a way which can be described adequately only in the terms of a system too complex for practical grammar.

Disregarding the so-called "fundamental laws of the mind," the scientific grammarian has tended to approach the subject from an inductive point of view, and has studied the individual forms of speech in relation to their corresponding moments of mental activity, rather than in relation to any supposed permanent characteristics of the mind. The significance of the definitions, according to this conception of grammar, is something quite different from the significance of the definition according to the philosophical or logical method of systematizing language. The scientific grammarian regards his definition as merely a convenient summary statement of the facts he has observed. It has no final sanction of any sort, but is open to alteration and to extension as new facts are added to the field of observation. The spirit of this method of grammatical study is consequently not dogmatic, but is the spirit of all inductive science in which generalizations are regarded as the summary statements of accumulated details. It follows that the definition, rules, or generalizations which the grammarian of this way of thinking wishes to make must be definitions or generalizations of only such phenomena as those for whom his grammatical system is intended are capable of observing and understanding for themselves. A completely scientific grammar of English would neglect no phenomenon of the speech, no matter how insignificant intrinsically or how limited the extent of its use. The ideal of the philosophic grammarian is to formulate all the activities of the mind into logical definitions, and then to illustrate these definitions by means of examples taken from the practice of the language. The ideal of the scientific grammarian, as unattainable as that of the philosopher, but perhaps a safer guide in actual practice, is to observe all the phenomena of the language as they are exhibited in use, and then to arrive at such principles or rules as will come without misrepresentation of the phenomena upon which they are based. This ideal aim of the grammarian must necessarily be modified in practice to accord with the more limited purposes of teaching and the more limited capacities of students. No matter how elementary the effort, however, the evidence of the vast number of contemporary or older English grammars goes to show that one or other of these two conceptions was uppermost in the minds of the writers, either that the grammar presented illustrations of the observation of immutable, logical laws of thought, or that it was a series of observations, classified and designated on the basis of their similarities, the classification being subject to modification according as the area of observation was increased or decreased. The grammars of the first type are represented by Murray's and by the large number of grammars which assume the position of arbiters of good use. The grammars of the second type, unfortunately not yet the prevailing one, are represented by modern historical grammars, the purpose of which is to make a descriptive statement of the past facts of the language, and also by an increasingly large number of practical school grammars written not from the point of view of dogmatic good use, but with the purpose of training the student in the observation and valuation of the processes of language. The earliest English grammars were written from the point of view of the Latin and for the purpose of making the study of the Latin easier.

During the larger part of the nineteenth century, grammar held — next to spelling — not only the principal place in English instruction, but, in the upper grades, the principal place in the curriculum of the elementary school. The two most famous grammars of the early days were Noah Webster's and Lindley Murray's, both published near the end of the eighteenth century. Murray's grammar became, like Webster's spelling book, the standard; and the authority of Lindley Murray was sufficient to settle any point of disputed usage or doubtful syntax.

The curriculum of the common schools included, up to the last quarter of the preceding century, little besides reading, spelling, arithmetic, geography, and grammar. In the upper grades grammar vied with arithmetic in the amount of time and energy devoted to it, and in the value and respect accorded to it in the schoolroom and in the community. To be known as a good "grammarian," that is, as a student versed in the grammatical rules as given in the textbook, and skillful in parsing and in syntactical analysis, was to win, in effect, a kind of intellectual preëminence. Moot questions of grammatical construction were often the subject of excited debate, like difficult, or "catch," problems in arithmetic. Grammar was, in brief, the intellectual jousting ground of many sharp and eager, though underfed, intellects. G. P. K.

Content and Nature of Grammar. — Diversity of purpose, of method, and of content are the most striking characteristics of modern English school grammars viewed as a whole. The constant features are discussions of the parts of speech, of inflections, and, to some extent, of syntax. Some grammars add phonetics, others the composition of words by prefixes and suffixes, or prosody, or the rules of spelling, or of paragraphing, or forms for letter writing, or symbols for proofreading, or tables of weights and measures, etc. This variety in the content of modern school grammars is partly due to the presence of survivals from older and outgrown conceptions of grammar.

The old-fashioned village grammar of general information, planned for students whose entire English training was obtained through the study of English grammar, accounts for some of the topics. Others, like prosody, for example, are merely survivals from the old Latin grammars. In the classical and Renaissance conception of grammar as an art comprehending the appreciation and practice of literature as well as the elementary rules of the language, prosody logically had a place. It survives now in grammars only because there is no other convenient place to put it. Of similar origin is the division of etymology, which is still used to describe a section of English grammar having to do with the forms of words, including inflections, derivation, and composition. In the old Latin school grammars, as for example in Lily, the two main divisions of the subject were etymology, *i.e.* accidence, etc., and syntax, *i.e.* concord. But the modern sense of the word "etymology" is something very different from this traditional use of the word, and what the old grammars call etymology would now be called morphology.

An examination of those modern grammars, written by persons of some independence of purpose and of scholarship, shows that three main conceptions of the subject, mixed in varying proportions, are prevalent. The first is the conception of grammar as a guide to good use, the second as the study of the system of the language in its broadest meaning as an expression of thought, and third a narrower definition of the system of the language, corresponding practically to the usual popular understanding of the term "grammar." The conception of grammar as a guide to good use no longer enjoys the favor it once received. This conception is also in large measure an inheritance from the Latin grammar of the Renaissance, in which grammar was defined as "the art of correct speaking or writing." This theory was first taken over explicitly into English grammar by Bishop Lowth in his *Short Introduction to English Grammar* (1767). In his preface, Bishop Lowth declares that "the principal design of a Grammar of any Language is to teach us to express ourselves with propriety in that language, and to enable us to judge of every phrase and form of construction, whether it be right or not." In other words, according to this theory, the purpose of grammar is to serve as a handmaiden to the art of speaking and writing. In communities of mixed racial and social provenience, in which there exists a confused and uncertain use of the idiom in colloquial speech, as is the case, for example, in most American city schools, it is necessary to give much attention to drill in the details of propriety of expression. Yet the tendency of modern theory and practice, which seems to be in the right direction, is to place less stress upon good use as the main principle of the study of grammar. It is coming to be recognized that the rules of use are so complex and so far beyond the grasp of the child that to place them in a grammar which makes pretense to a reasoned system is bound to end in confusion. Presented merely dogmatically, without attempt at rational or historical explanation, the rules of use find a more justifiable place in the study of written composition or in the drill of the daily colloquial intercourse of the classroom. Although the end, therefore, of inculcating good use may be to some extent attained by the study of grammar, it is now usually assumed that this end should be one of the by-products of such study, and not its main purpose and justification. Such being the case, the custom of introducing examples of bad use into the study of grammar is one of doubtful expediency. The safest rule seems to be to include in the system of elementary grammar only what is recognized as the normal use of educated people, with an exception perhaps in favor of occasional instances of divided use.

The two remaining theories concerning the teaching of grammar have this in common, that they both endeavor to approach the subject in a measurably scientific and systematic spirit. They differ widely, however, in the theoretical limits which they place upon the subject. In the broader conception of the two, the limits of grammar are made commensurate with those of the science of language, or the relations of speech to thought. Thus, according to one writer, "Grammar may be defined as the study of the relation between mental action and the forms of language expression" (Davenport and Emerson, *Principles of Grammar*, p. 1), the main stress being here placed upon logic. Another declares that "Grammar is a systematic description of the essential principles of a language or a group of languages . . . . English grammar gives a systematic account of the English language" (Carpenter, *Principles of English Grammar*, pp. 1–5). A broad theoretical definition of this kind is manifestly impossible in practical execution. No elementary grammar can attempt to study in any systematic way all the principles, either logical or historical, which lie at the base of a language. Whitney (*Essentials*, p. III), with his usual wisdom, states the only position which the scientific study of elementary grammar can maintain. He avoids a positive theoretical definition of the subject, but announces his practical purpose to be "to put before the learner those matters which will best serve him as a preparation for further and deeper knowledge of his own language, for the study of other languages, and for that of language in general."

The study of elementary grammar, either as the science of language or as preliminary preparation to the science of language, is a way of regarding the subject which has arisen naturally from the modern science of linguistics. It would seem, however, that the content and purpose of the teaching of elementary grammar should be determined by the possibilities and needs of elementary instruction rather than by scholarly theories of the subject. In answer to this conviction, we have a third conception of grammar, which still endeavors to be systematic, but does not try to cover the whole field of linguistics. According to this understanding of the subject, elementary grammar is defined as " an account of the relations which words bear to one another when they are put together in sentences " (Buehler, *A Modern English Grammar*, p. 11). Or again, it is " the science which treats of the nature of words (*i.e.* the parts of speech), their forms (inflections), and their uses and relations in the sentence " (Baskervill and Sewell, *English Grammar*, p. 12). A third definition makes grammar " the science which treats of the Forms and the Constructions of words " (*i.e.* of inflections and syntax) (Kittredge and Arnold, *The Mother Tongue*, Book II, p. xv–). Grammar, as thus defined, takes account chiefly of the relationships of words to each other in groups. The unity which it attempts to impress upon the mind of the student is the unity of the word group, and ultimately of the sentence. A unified conception of a science of language, either from the logical or historical point of view, is not implied in these treatments of the subject, and though historical and other considerations may be admitted, if it seems advisable to admit them, it should be recognized that the unity of the sentence is the essential element which determines both the content and method of such teaching of the elements of grammar. Thus limited, the subject becomes practically syntax.

In a strict application of the theory of the study of grammar as the syntax of the sentence, a number of features commonly included under the heads of grammar will be seen to be out of place. In the classification of the noun, for example, the distinctions of concrete and abstract, of common and proper, etc., have purely logical and not syntactical value. Some grammars give a class of " material nouns," glass, wood, iron, etc., which suggests to what extremes a logical classification of nouns could go. In the same way, the gender of nouns is of little syntactical significance. In the grammar of the earlier periods of the English language, when gender was still a grammatical, not merely a natural distinction in nouns, the rules of concord made gender very important syntactically. But in modern English the question of gender in nouns is raised only when the agreement of the personal pronoun of the third person singular with its antecedents is to be determined, and here also the feeling is for logical rather than formal grammatical agreement. The same principles apply to many of the subclassifications of the other parts of speech, *e.g.* of the adverb, as of time, place, manner, degree, distance, etc.; of the conjunction, as concessive, causal, temporal, local, etc. In a rigid definition of grammar as the study of words in the context of the sentence, such logical subclassification can find a justifiable place only when they make clearer the functional nature of the part of speech in question.

The task of teaching elementary English grammar is harder than it would be if every syntactical construction told its meaning by the forms, or inflections, of its words. English, however, has lost practically all of its inflections, and it is in the necessity of apprehending function, whether with the aid of form or without it, that the teacher finds his main difficulty, as also his greatest opportunity. By a process of abstraction, words are taken up and discussed as parts of speech as though they could have meaning and function independent of their combinations with other words. In considering inflections, this abstract discussion is continued by associating with the noun, for example, the formal marks of numbers, with the pronoun the marks of numbers and case, with the verb the marks of person or tense, in each instance as though number, person, tense, etc., were characteristics which may have existence apart from context. These abstractions, however, are merely the way of approach to the vital organization of the parts of speech mutually dependent upon each other. Having analyzed the elements of speech, the student is then brought to synthesize them in the formation of speech. The language upon which study should be based obviously should not be too remote from the experience of the student — not puzzles of grammar, or the language of literary prose and poetry. It should be normal language of daily use, and the student should realize that the real life of language passes not only in the minds of authors and scholars, but in his own and in the mind of every one who uses the language.

The completed sentence is the largest term in which the language consciousness of the naïve speaker or writer moves, and beyond this, in the group of sentences, in the paragraph, and in the essay, etc. As a whole, there is unity, but it is unity of an entirely different kind from the unity of the sentence. One may think and write the English language without the paragraph, but not without the sentence. The sentence is the necessary unit of expression, and the mastery of it entails at least a practical command over the English language. It is in this way that grammar, considered as the study of the sentence, connects with the study of the art of expression. It should be the result of the study of grammar that students become aware of the plastic nature of language, and although questions of effectiveness in speech are not primarily questions of grammar, they are close and material sequences of grammatical speculation. Though the conception of grammar as the study of the functions and the forms of words in sentence-forming combinations may seem narrow as compared with the broad program of the science of language, it nevertheless leads to what is the practical end and reason for the existence of all language, the expression of thought by means of the grouping of words. The teacher of elementary grammar has no need to feel that he has set his mark too low in endeavoring to bring his students to an intelligent conception of what is meant by the sentence in the study and in the use of the English language. G. P. K.

Methods of Teaching Grammar. — The present tendency in the teaching of English grammar is greatly to contract the instruction, both in time and content, a tendency arising, first, from the current practice of requiring a new educational justification for all subjects in the curriculum, and, secondly, from the crowding of the curriculum by new subjects. In many of the best schools formal grammar occupies not more than three lessons per week for two years, and in some schools even less time. Many distinctions and classifications, such as are referred to above, are omitted, either as having no practical value or as being without meaning to an immature mind. The general value of grammar as formal discipline is now largely discredited. Its worth to the student seems to lie in three things: its occasional guidance in matters of incorrect or doubtful usage, its training in the process of thought as cast in the forms of the sentence, and its assistance to the student in the study of a foreign language. To these may be added its tendency to arouse intelligent interest in language as a subject worthy of intelligent attention, especially when some of the historical features have been incidentally introduced into the study.

The long-recognized difficulty of teaching grammar successfully is due mainly to its abstract nature. Young pupils do not easily or naturally grasp grammatical abstractions; hence the necessity for limiting the amount, for selecting those principles that are simplest or most necessary, for frequent repetition, for confining the work to intelligible sentences, for abundant drill and frequent repetitions, and for connecting grammatical study as closely as possible with the pupils' oral and written use of the language. Even under the best instruction it is to be expected that pupils will often err, often be confused, and generally forget much that they once knew rather well; for abstractions are neither clear nor permanent in most minds.

The order of procedure in the instruction has been under much discussion, two general plans being suggested: from the word to the sentence (the older, and formerly the invariable, plan), and from the sentence to the word. In the former the pupils first learned the parts of speech, that is, noun, verb, etc., with their definitions and with or without examples in sentences; that is, they began with the so-called etymology. In the second plan the study begins with the sentence (*i.e.* with syntax), considering first the general subject and general predicate, then viewing the sentence as consisting of strict subject and strict predicate (noun and verb), each of them possibly with or without a modifying word or phrase, and so proceeding by steps of analysis to the ultimate elements, *i.e.* the words (see Barbour's *The Teaching of English Grammar*, 1901). Various modifications of this second plan, in combination with the first, are now in general use; textbooks and teachers differing mainly in the stages at which they introduce the detailed study of the various parts of speech. This plan makes it possible to introduce some of the simpler elements of grammar as early as the fifth or sixth year in connection with the pupil's writing, and so to prepare him gradually for the more difficult study of formal grammar in the textbook.

A considerable amount of drill is necessary in all teaching of grammar. But certain changes have been made in the matter and substance of drill. It is important to proceed not merely from the examples to the principles, but also from the principles to the examples; the pupils being required, for instance, not merely to identify adjective clauses and adjective phrases, but to write sentences containing these elements. Parsing, that is, identifying the part of speech of a word and pointing out its relations, has no longer the large place it once had. Its value is doubtful as a means to the real function of grammar, *i.e.* the study of the sentence; and its propriety or even possibility must often be questioned. There are many single words that cannot be parsed. They must be taken in connection with other words, as a group, before their relation to the sentence can be indicated. Nor is it permitted to change the forms of expression to bring words under the rules. Such a change only makes a new sentence. It must furthermore be noted that certain conventional explanations of construction were made before the study of English philology had explained their real origin. An example is the so-called " retained object " with the passive voice, as in the sentences *I was given a book* and in the phrase *one by one*. Many instances could be cited showing the disappearance of inflectional indications of agreement or concord, and other departures from the Latinized conceptions on which our older English grammars were based. (See Goold Brown, *Grammar of Grammars*, Introduction.)

In general, therefore, teachers at home in the subject are inclined to doubt the advisability of much " parsing." Drill in syntax has come to occupy a much more important place, and " diagraming " is still in favor as a short and convenient way of indicating relationships. In the study of both etymology and syntax the old logical conception is rapidly giving way before the more scientific view of

English as an idiomatic speech whose special features are to be explained only by a knowledge of their origins.

One important question of method remains to be considered: How far should the study be inductive? We proceed in the main from examples to principles and definitions; but principles must be reënforced by, and reinterpreted in terms of, examples. Some of the more difficult conceptions, as those of verb phrase, conjunction, preposition, are best taught almost exclusively by examples.

F. T. B.

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See also the introduction to the various school grammars.

GRAMMAR GRADES. — The elementary school normally covers eight years of work, which may be begun at about the age of six years. The upper four years of the elementary school are known as the grammar grades, as the lower four are called the primary grades. Sometimes, because of exceptional administrative conditions, the fifth year of school may be included among the primary grades, as in the case where a primary school building includes the first five years of work, or where these first five years of work are set off because the departmental system of instruction by specialized teachers does not cover more than the sixth, seventh, and eighth years. The grammar grades, while normally covering four years, may be four or eight in number, depending upon whether or not the graded system provides for annual or, as is the usual case, semi-annual promotions.

H. S.

GRAMMAR-HIGH SCHOOLS. — A term used in the school laws of California to designate a two-year high school, to which state aid is given. Such schools represent the first two years of the regular high school, and are to be established where full four-year high schools are not as yet needed. The term corresponds in a general way to the term Township High School, as used in the upper Mississippi Valley to designate short-course schools which have not been "accredited" or "commissioned" as full high schools. (See High Schools, Rural.)

E. P. C.

GRAMMAR SCHOOL. — To write the history of grammar schools would be to write the history of elementary and secondary education from their dim beginnings in Hellas in the fifth or sixth century B.C. to 1850, when the greater number and the chief of the secondary schools on both sides of the Atlantic were still called Grammar Schools. Even where the title has been dropped for that of Public School, Latin School, Academy, Gymnasium, High School, Lycée, Ginnasio, these are still essentially grammar schools, and, what is more, the chief of them still Greek Grammar Schools.

The term Grammar School (γραμματεῖον) simply meant a Letter School, a place in which letters (γράμματα), that is, spelling and reading, were taught. But it has always been found that it is impossible to teach even reading properly without teaching much more, and the term *grammata* soon came to connote an ever-widening circle of learning till it became identical with literature in its widest sense. Already in the sixth century B.C., the vases show the boys learning writing as well as reading, and standing up to say their repetition of Homer, while in later days they received prizes for public competitions, not only in "rhapsody," but in successive stages of recitation of tragic, comic, and lyric verse. Naturally, poets had to be explained and understood for effective recitation, and the whole of literary comment, the science of grammar, the art of scholarship, criticism, and composition was developed from the grammar school.

Grammar and the grammar school were developed at Alexandria, where the Macedonian variety of Doric-speaking students of Attic writers perhaps required more assistance from grammar proper. The grammar school was transplanted full grown to Rome. Plautus, *c.* 210 B.C., used the term in its Latin translation of *ludus literarius.* (For the development of this school, *ludus literarius,* and the later rhetoric schools, see Roman Education; Quintilian; Endowments, Educational.) A Greek grammar school had been set up by Livius Andronicus, a Greek, in 272 B.C. At Rome the early grammar schools were more advanced than those of Greece, where the grammar schools were confined to literary explanation and criticism, while according to Suetonius the early grammar schoolmasters at Rome also taught rhetoric and "many of their treatises include both sciences," *i.e.* grammar and rhetoric. In later days at Rome, as in Greece, the two were separated, the grammar school teaching the boys till about fourteen and confining themselves to literary construction, the rhetoric school including every study which could fit a youth to become a good speaker. Quintilian, whose *Institutes of Oratory* is the only complete ancient educational work which has come down to us, shows that the grammar school had extended its boundaries to include, for instance, the teaching of history and the elements of philosophy, leaving the rhetoric school to be more professionally and professedly a " talking shop." The grammar school and the rhetoric school were ubiquitous through the Roman Empire. From the end of the first century A.D. they came to be largely provided at the public expense by the municipalities or by endowments (see ENDOWMENTS, EDUCATIONAL), while the later Emperors, and particularly Gratian in 376, charged their maintenance on the *fiscus* or the rates and fixed the salaries payable. When the barbarian kingdoms began to settle down, the grammar schools became more than ever necessary, in a sense, for teaching Latin as the foreign tongue, in which new nations found their religion and their law enshrined and administered. While the rhetoric schools, therefore, disappeared, the grammar schools went on; and, so far as the higher studies of the rhetoric school were needed, they were studied in the grammar schools, which passed under the control of the bishops. It is difficult to say when they ceased to be public schools and became episcopal schools, if indeed it is possible to draw any such distinction, for the bishop seems to have stepped into the place of the civil magistrate in respect to public order generally as much as to education. (See BISHOPS' SCHOOLS.) The earliest mention of a school in England distinctly calls it a grammar school. It was when Bede (*Eccl. Hist.* iii, 15) related how in 631 Sigbert, King of the East English, who had been converted to Christianity when an exile in France, desiring to imitate what he had seen well arranged there, set up a school in which boys might be taught grammar (*litteris erudirentur*), and got masters and ushers for the purpose from Canterbury. Alcuin would no doubt have called the school of famous Cathedral York, which he describes a century later (731 to 780), a grammar school. For, though its curriculum included law, music, astronomy, geometry, arithmetic, and theology, yet grammar and rhetoric are put first, the master industriously giving to these the art of the science of grammar and pouring on those the rivers of rhetoric, while the writers on grammar from the Vergilian commentator, Servius, to Probus and Priscian bulked most largely in the school library. At the end of the eighth century (*c.* 796), Alcuin recommended his quondam pupil, the then archbishop, to separate the grammar school (*qui libros legant*) from the song and the writing schools (*qui cantilenae inserviant, qui scribendi studio deputentur*). The current custom for bishops to maintain grammar schools at their sees was made general law by the canon of Pope Eugenius in 826, ordering all bishops to maintain grammar schools (*studia literarum*) in which the principles of the liberal arts should be taught, an enactment repeated by Pope Gregory in a synod at Rome, *c.* 1073. It is stated in Asser's *Life of Alfred* (*c.* 1001) that the King's youngest son Ethelward was sent to the grammar school (*ludis literariae disciplinae*) with nearly all the noble children of the realm and many who were not noble; a statement which is at least rendered probable, and probably taken from the educational program set forth by Alfred himself in the introduction to his Translation of Gregory's *Pastoral Care.* Alfred (*q.v.*) desired that all the young English freemen should be set to learn to read English, and those who wanted to continue in learning and reach higher rank should learn Latin. Alfred the Great (*q.v.*) is credited with the establishment of grammar schools, while Ælfric's (*q.v.*) *Saxon-Latin Grammar* (*c.* 1005), being excerpts from Priscian's grammar, purports to be a grammar as taught in the school of Ethelwold, Bishop of Winchester. So too the Danish king, Canute, is credited by his eleventh-century biographer with founding public schools (*publicas scolas*) to teach boys grammar (*litteris imbuendos*). In the school attached to the collegiate church of Waltham, founded by King Harold when earl, grammar and Latin verse-making were learnt. The earliest use of the actual words " grammar school," *scola gramatice,* as distinct from its Latin equivalent, *ludus literarum,* is in a charter of the last half of the twelfth century, in which Henry, Count of Eu and Lord of Hastings, confirmed the foundation by his grandfather Robert, Count of Eu, who received Hastings from the Conqueror, of the Collegiate Church of St. Mary in Hastings Castle and the division of its possessions into separate prebends among the several canons or prebendaries, including " Auscher's prebend to which belongs the keeping of the grammar school (*regimen scole gramatice*)," while " to Wyming's prebend " pertains " the keeping of the Song School (*regimen scole cantus*)." It is not clear whether Count Henry is quoting the words of Count Robert or translating them into the language of his own time. But it can hardly be doubted that the Warwick School, Gloucester School, Pontefract School, Thetford School, St. Paul's School, St. Alban's School, Huntingdon School, Dunstable School, and Reading School, — to mention some which are so called in extant grants of the latter part of the eleventh and first part of the twelfth century — would have meant the grammar schools of those places; just as in the present century they would bear the same meaning, though for the most part the masters aspire to drop the qualifying epithet and call them by the place name *tout court.* In the thirteenth to the nineteenth centuries inclusive it was thought more honorable to insert the qualifying epithet of "grammar" school. This became necessary in the thirteenth century to distinguish grammar schools from the schools of the higher faculties at the universities, and the Theological Schools, to which the schoolmasters of cathedral and collegiate church grammar schools, when they changed their name to the less known and intelligible, and therefore more magnificent title of Chancellor (*q.v.*), confined their ministrations. A notable illustration of the way in which the Cambridge School was shorn of its prestige and glory by the side of the university is to be found in the order made by the diocesan of Cambridge, the Bishop of Ely, in 1276. From this it appears that the Master of Glomery (*q.v.*) had still jurisdiction to hold legal pleas in which grammar scholars were concerned, as the Chancellor of the University had in those to which university students were parties. He too had a bedell or beadle to bear a mace before him, not only *honoris causa*, but also as the physical implement with which to enforce his jurisdiction, just as the Chancellor had, who was in fact only a higher schoolmaster. Similarly the Canterbury grammar schoolmaster in the years 1310 to 1327 exercised jurisdiction in cases between his scholars and the laity, enforcing by excommunication the sentences he imposed as judge of his court, in school, sometimes expressing his acts as "done in Canterbury school," sometimes "in Canterbury Grammar School." In London, what was called in 1138 the "School of the Arches," or St. Mary-le-Bow, appears in 1300 on the appointment of a master as "the Grammar School of the Church of St. Mary-le-Bow or of the Arches." (See ARCHES, SCHOOL OF THE.) So at St. Alban's, the school over which the famous Alexander Neckham (*q.v.*) presided in the thirteenth century as St. Alban's School, is in 1309 called St. Alban's Grammar School. In that year its master, sitting "as Judge of the law of the Grammar School of St. Alban's," made statutes in and for it in quasi-regal style "by the unanimous consent of the Master and all the Bachelors" of it. He too exercised his jurisdiction over laymen as well as clerks, forbidding any one to assault or defame any of the scholars on pain of excommunication *ipso facto;* while if any one assaulted the master himself, not only was he excommunicated, but was also subjected to "salutary chastisement in the school from all the Bachelors of it, unless he had previously made satisfaction to God and the church." The common notion, derived chiefly from a misinterpreted passage in Richard of Bury's *Philobiblon* referring only to the masters of small village schools, that the grammar school master was of no importance, a person looked down on, is contradicted by these documents, which also correct the erroneous notions as to the limited character of the curriculum of these schools. No one could become a bachelor in St. Alban's Grammar School unless he first obtained from the master a proverb, on which, as a theme, he had to compose verses, prose, and rhyme (Leonine or rhyming Latin verses?) and also make an oration publicly in the schools. Nor was any bachelor coming from elsewhere to take a seat in the school, unless he had first been examined in the rules of grammar by examiners appointed by the master and was prepared to dispute publicly in the school on them "or any other subject put forward," just as in the university. At Beverley the newly created bachelors had to make presents of gloves to a large number of the officials of the minster, just as they did at Cambridge University. But the growth of the university seems to have stopped this practice of creating bachelors in grammar schools, and we hear no more of them after the fourteenth century.

While the universities competed with the grammar schools in their upper portions, the song schools, which became to a large extent also reading schools, competed with them for their lower boys. Thus at Warwick about 1316 the Dean and Chapter made statutes to define the provinces of the grammar and music schools, assigning the Donatists, or those learning the elementary parts of Latin grammar, the Donat, to the grammar school, while confirming the music master in the possession of those learning their first letters, the *grammata* of the original Greek grammar school. Similarly at Canterbury the parochial school, maintained by the rector in connection with St. Martin's Church, was impeached by the rector or master of the Archiepiscopal or City Grammar School for competition with him in taking grammar scholars, and was after trial by jury found to be customarily entitled to take thirteen grammar scholars only, though it might receive an unlimited number in the alphabet, psalter (*i.e.* reading Latin), and singing. A century later, the grammar schoolmaster at Saffron Walden obtained a decree from the Abbot as Ordinary of Walden prohibiting the priests of the chantries connected with the parish church from teaching grammar or any higher subjects than the alphabet and the graces (*alphabeticis et graciis*) *i.e.* the graces before and after meat, for long misinterpreted as *graecis*, and alleged to show a Greek-teaching school in 1425.

As some indication of what was learned in the grammar schools at this time, it may be mentioned that a feeble, or tattered (*debilis*) Horace was bought for the Merton Grammar School boys in 1348 for a half-penny, while several pairs of white tablets for reporting arguments cost 2½*d.*, showing that the dialectic method was applied to grammar as to other subjects. The master of this school at the time was Master John Cornwall (see CORNWAILE, JOHN). The successive attacks of the plague in the Black Death (*q.v.*) in 1349, the Second Plague in 1361, and less well known but still destructive outbreaks in 1369 and 1380 made such havoc in the knowledge of Latin that special new endowments appeared necessary to restore it. Hence the great increase of endowed grammar schools (see ENDOWMENTS, EDUCATIONAL), of which Winchester College, founded in 1382, was the leading example. Never, perhaps, had the superior efficacy of grammar as " the foundation, gate and source of all the liberal arts " — the essential element of a liberal education — been more emphatically proclaimed than in its foundation charter. For the first time a grammar school was made the principal or indeed the sole object of a collegiate church, as important a step forward in educational provision as the foundation of the first collegiate church as a university college in Merton College had been a hundred years before. It is much to be regretted that the object and curriculum of a grammar school was so well understood at the time that the elaborate code of statutes made for " Sainte Marie College of Wynchester " in 1400 contains not a word as to the content of the curriculum, nor the method of teaching; but merely prescribes that candidates are to pass a competitive examination in the " Old Donat " and plain song for admission " to study in grammaticals or the art faculty or science of grammar." An equal parsimony of details is found in the numerous grammar schools endowed in connection with colleges, chantries, gilds, and hospitals from that time to the eve of the Reformation. Though three hundred and more of these grammar schools were founded or refounded, endowed or reëndowed, very few of the foundation deeds or statutes have come down to us; but, judging from those which have come down, they would not have greatly enlightened us. The greatest and richest of all the free grammar schools, the College Roiall of Our Lady of Eton (*q.v.*), was a mere replica in its statutes, as in its foundation, of that of Our Lady of Winchester. Colet (*q.v.*) was no doubt expressing the sentiments of all, when in his statutes for the refounded and augmented St. Paul's School in 1518, he said, " what shall be taught . . . it passeth my wit to devyse and determyn in particuler." Nor did he unfortunately vouchsafe any details when he went on to say " in generall " that the scholars were to be " taught all way in good litterature " and to denounce the " barbary, corrupcion " and "*Laten adulterate* " which " ignorant blynde folis brought into this world," the " fylthynesse and abusion " which " rayther may be called blotterature than litterature," and went on to demand the " olde Laten spech, the veray Romayne tong " of Tully and Vergil, as found in St. Augustine, St. Jerome, Sedulius and Juvencus, and other Latin Christian writers of the lower Empire. What, besides Alexander de Villa Dei's (*q.v.*) *Doctrinale*, or grammar in verse, was included in " Blotterature," we can only guess. Colet did not succeed in substituting the late Latin-Christians for the earlier classical authors in grammar schools in general, though he apparently revived them, as Milton's reading appears to show, at St. Paul's. The statutes of Cardinal Wolsey, for the grammar school of his college at Ipswich, made in 1528, are preserved; and a year or two later we have parts of the curriculum of Winchester and the whole of the curriculum of Eton as sent to Saffron Walden for adoption in the newly refounded and endowed grammar school there. These show that the *Latin Accidence* of Stanbridge, scholar of Winchester and Master of Magdalen College School, of which Wolsey had himself been master, with at Eton the grammar of Lily, first master of the refounded St. Paul's School, and at Winchester that of Sulpicius, a fifteenth-century schoolmaster at Rome, had superseded Donatus and Alexander de Villa Dei. The lower forms read the pseudo-Cato's *Moralia*, as their predecessors had done at Merton in 1308 and centuries before that, and Æsop's *Fables*, which were still in vogue at Highgate Grammar School in 1860. For the rest, they read Lucian's *Dialogues* (in Latin), Ovid's *Metamorphoses*, Terence, Cicero's *Paradoxes*, Vergil's *Eclogues* in the Fourth Form; in the Fifth, Sixth, and Seventh, Sallust, and Vergil's *Æneid*, Cicero's *Letters*, and Horace; with the figures of speech of Mosellanus, a German schoolmaster named Schade, of a pronouncedly Reformation type, scoffing at Saints and Saints' Days, and Erasmus' *Copia verborum*, which was much like Ælfric's *Colloquy* and word books of the eighth century. Cæsar is the only author mentioned by Wolsey who does not appear in the Winchester and Eton curricula. Greek, it appears, was not taught, though it probably had been a little earlier under Horman.

Five years later the Reformation in England began with the dissolution of monasteries. Its educational first fruits are found in the statutes for the grammar schools attached to the cathedrals of the new foundation of Henry VIII, under the new deans and chapters in lieu of the old cathedral grammar schools, under the immediate cognizance of the bishops. There is no noticeable difference in the curriculum. The master is indeed called by the high-sounding name of *archididascalus*, instead of *Magister Informator* or *Magister scolarum*, and the second master, *hypodidascalus*, instead of *Ostiarius* or Vice-monitor. Greek as well as Latin is now required of the master, though Latin only of the usher. The object of the foundation scholars, lodged, boarded, and clothed at the expense of the cathedral endowment, is expressed, as before, to be to obtain a fair knowledge of Latin grammar and to talk and write Latin. No Greek author is mentioned in the curriculum, which includes vaguely the chaste poets and the best historians, and in the Sixth or highest form Erasmus' *Copia* with " Horace and Cicero and other authors of that class." In none of the re-foundations under Edward VI and Elizabeth is any inkling given of the curriculum contemplated beyond the direction that the newly constituted school is to "endure to all future time for the education, institution, and instruction of boys and youths in grammar." (See Free Schools; Edward VI; Elizabethan Period in English Education; Reformation and Education.)

That Greek had by this time crept into the schools is shown only by the salvos of verses presented to the King when he visited Winchester and Eton, perhaps five per cent of which are in Greek. It is not till we come to the statutes made by Queen Elizabeth in 1560 for the grammar school attached to the Collegiate Church of the Blessed Peter of Westminster, which took the place of the abbey dissolved by Henry VIII and reinstated by Queen Mary, that any difference in subject or detailed curriculum is forthcoming. The duty of both master and usher, *ludimagister* and *præceptor*, is defined to be to teach Latin, Greek, and Hebrew grammar, *literæ humaniores*, poets and orators. Cato and Æsop still prevail in the lowest forms with Vives (*q.v.*); Terence and Sallust in the Third Form. In the Fourth Form Greek grammar appears with Lucian's *Dialogues* in Greek; in the Fifth Form, Isocrates and Plutarch; in the Sixth and Seventh, Demosthenes and Homer as well as Livy and Vergil. Only the Seventh Form was actually to be taught Hebrew, devoting the last hour between five and six every school day to Hebrew grammar with a reading in the Psalms in Greek and Hebrew. That Hebrew remained an integral and effective part of the curriculum at Westminster is clear from the evidence of Charles Hoole's *New Discovery of the Old Art of teaching school* (1659). He testifies that Westminster boys under Busby (*q.v.*) made orations and verses in Hebrew and also "Arabick and other oriental tongues" "to the amazement of most of their hearers." But though Hebrew was included in many school statutes up to the latter part of the seventeenth century, and Hoole includes it in his ideal school for three mornings a week, and Mills in 1741, in his *Pueritiæ formandæ artifex*, includes Hebrew and *Lyra Prophetica* for those boys who "wished to be clerics," it never had real hold in the grammar schools. It is still taught to a limited extent at Merchant Taylor's School, reputed to be founded in 1560, the same year as the Elizabethan statutes were given to Westminster; and was traditionally taught a few years ago at Louth Grammar School in Lincolnshire. The net result of the Renaissance and Reformation on the curriculum and methods of grammar schools was little more than to place Greek in the same position as Latin; with more éclat attaching to a real knowledge of it, but less consequence attached and less effort made to attain that knowledge in the majority of pupils.

As to the class which attended the grammar schools, it is certain, notwithstanding oft-repeated assertions and commonly received notions to the contrary, that it was in the main the same as now, that is, the middle class, the younger sons of the nobility, including in that term the whole knightly class and squirearchy, the great and small landlords, the professional classes, which at first were almost entirely the common lawyers, as the medical men and the chancery and ecclesiastical lawyers were mostly clerks and ousted from matrimony, the merchants and tradesmen. The chief difference is that to this class since the Reformation new recruits came forth from above and from below, from the eldest sons of the landed classes and from select individuals of the working classes. In Alfred the Great's family, according to Asser, the eldest son was brought up in chivalry, in hunting, and the arts of war, with only so much literary instruction as to learn Saxon poems by heart and to read Saxon, while the youngest son was sent to the grammar school. This practice was followed in other noble families with few exceptions throughout the Middle Ages, up to the latter part of the sixteenth century, the tincture of literature being probably less in the tenth to the twelfth centuries than in the ninth, and growing as learning grew from the thirteenth century onwards. Throughout, the younger sons even of the noblest families went to grammar schools and acquired learning for the clerkly profession, which included not only bishops and priests, but the whole of the government services, diplomacy and the law, and, increasingly, *la haute commerce*. While William Rufus was a rude soldier, the younger son Henry was sent to school, and learned grammar, and, as William of Malmesbury mentions, when he became king, in all his wars and troubles never forgot his learning or to read books. The celebrated Abélard was the eldest son of a Breton knight and landowner. Thomas à Becket, who is expressly recorded as having passed through the school of the city of London, *i.e.* St. Paul's School, before going to Paris University, was the son of a sheriff of London in the days when aldermen were still hereditary landowners and their offices territorial governments. On the other hand, Abbot Sampson of Bury, who also went to Paris University, was so poor that he could not pay the penny fee at Bury School, and at Paris eked out his living by carrying holy water. The archbishops and bishops, deans, archdeacons, and canons, who had all been at grammar schools, and after the twelfth century mostly at universities, were predominantly of noble birth. It was one of the grievances of the chapter of Lincoln, when Bishop Grosseteste (*q.v.*) wanted to "visit" them, that he was not a gentleman. When Henry III wanted to hang the Oxford scholars, recruited from the grammar schools, who had taken a leading part in the defense of Northampton in 1264, he was prevented by the barons of his own side, who protested that they were not going to have the blood of their sons and relations shed. A fourteenth-century list of the scholars of Paris University contains several counts and other nobles of various nations. The first " poor and needy scholars " of Winchester and of Eton were scions of well known county families, and the " Commoners " of Winchester, many of whom became scholars, were by statute bound to be " sons of the nobility " and were so in fact to within twenty years of the Reformation, when the lists cease. The Eton statutes excluded villeins, which included the majority of farmers and artisans. In 1447 the University of Oxford petitioned the Lord Say and also the House of Commons for their help to get Duke Humphrey's library for them, on the express ground that " many of your noble lineage and kinsmen have studied and shall hereafter in the said University." As a matter of fact, we know at least one relation of Lord Say who was a scholar of Winchester and fellow of New College, Oxford, and another who was a scholar of Eton. Macclesfield Grammar School was founded in 1503, expressly for " gentilmens sonnes and other godemennes children of the towne and contre thereabouts." Colet ordered that his free scholars should provide wax candles for the school at the cost of their friends, when wax was a costly luxury. But perhaps the most striking testimony to the fact that the grammar schools were mostly frequented by the upper classes is the story of the admission of " poor scholars " on the new foundation of Canterbury Cathedral Grammar School in 1541. " More than one or two of the Commissioners would have none admitted but sons or younger brethren of gentlemen; as for others, husbandmen's children, they were more for the plough and to be artificers than to occupy the place of the learned sort." Archbishop Cranmer, himself a scion of an ancient family in Nottinghamshire, had to stand up for the new idea of admitting the really poor and to protest not in favor of a majority of poor, but against "utterly" excluding them. At Canterbury, as at Worcester, the names of the scholars admitted are those mainly of the county families of Kent and Worcestershire. The admission of the working classes to participate in the schools was one of the new ideas of the revolution called the Reformation, and was one of the objects of the great increase in free, *i.e.* gratuitous, schools which followed it. At the same time another effect of the Renaissance and Reformation was the increase also of the uppermost classes in the grammar schools, though it was not till the seventeenth century that the eldest sons of great nobles are found in them. It was thought something of a scandal when, in 1569, the heir of Broughton castle, afterwards Lord Say and Sele, became a scholar of Winchester College as Founder's kin. It was not so regarded a century later when Sir Robert Walpole was a " poor and needy " scholar of Eton. Until the distinction grew up in the eighteenth century between the great grammar schools which became known as public schools to which aristocracy flocked, and the smaller schools, the ordinary country grammar schools presented a real mixture of classes. The local nobility and gentry were found in them side by side with the local tradesmen and farmers. The sons of the former, passing on to the universities as commoners at Oxford or pensioners at Cambridge, often took the sons of the latter with them as servitors and sizars. This practice had descended from medieval times, when the servitors who were numbered with the *socii* of a rich man and lived in the same hostel were more often poor relations than of a lower class. The truth is that in the grammar schools, as in the church itself, and the professions as in other institutions, the progress has been from aristocracy and exclusion to democracy and the open door.

It was not considered after the Reformation any more than before that the grammar schools should teach anything but the classical languages. But the later years of Queen Elizabeth's reign were marked in many grammar schools, especially in the smaller country town, by the attempt to introduce English reading and writing and arithmetic in the lower parts of the grammar school under the usher. In the seventeenth century, especially during and after the commonwealth, it became almost a commonplace for the founders of small country grammar schools, of which there were a large number, to prescribe English grammar, and Latin only " if required." But it was not till close on the Commonwealth period itself that it occurred to people to found separate English schools or elementary schools, not grammar schools and commonly free (see FREE SCHOOLS). But the pathetic belief in the magic of Latin grammar as an indispensable talisman to unlock the doors of knowledge prevailed spasmodically even to the nineteenth century, even when the founders were clearly not thinking of providing education for the class who would go to the universities. But at Whittington in Derbyshire, founded in 1681 for " 20 of the meanest and poorest mens' sons born in the parish," Latin as well as English and accounts were prescribed; at Lowestoft in Suffolk in 1735 a schoolmaster was to teach forty boys, with preference to fishermen's children of the parish, writing, reading, accounts, and Latin; at Wigglesworth in Yorkshire in 1789 a sum of £1000 was willed for the establishment of Clarke's Free School to teach children born in the township, or whose parents were legally settled there, Latin, English, writing, and accounts.

In the seventeenth century English began to take a more permanent part in the grammar schools, not that it was ever taught as a set subject and studied as a language or literature in school, but the practice began of making English versions of Latin verse and English essays in classical subjects. At the end of the seventeenth century, though French began to be studied and French dictionaries and phrasebooks to be written, it was taught in separate schools. Perhaps the earliest recorded instance of a French master teaching French in an ordinary grammar school known is that of a French usher at Croydon Grammar School, then part of Archbishop Whitgift's hospital, about 1717. But from the rather casual way in which he is first mentioned it is certain this was not the first instance of such ushers.

The unwillingness, and, according to legal decisions, the inability of the grammar schools to open their doors to modern subjects on a level with the ancient languages led to a marked decay in them during the eighteenth century. (See EIGHTEENTH CENTURY IN ENGLISH EDUCATION.) In 1805 in the Leeds Grammar School case (*Attorney-General* vs. *Whiteley*, 11 Ves. 241) Lord Chancellor Eldon (*q.v.*) stopped the efforts of the governors of the school to provide for the admission of modern subjects, holding that the Court had no authority to fill a school intended to "teach the learned languages grammatically" with "scholars learning the grammar and French languages, mathematics, and anything except Greek and Latin." A separate branch of the school to teach these subjects "might be very useful to the youth of Leeds, but could not possibly be represented as useful to the charity," and it was to the utility of the charity the court had to look. This decision stopped all reform of the grammar schools, except when, as in the case of Leeds itself, the endowment was large enough to go to the cost of a private act of Parliament. A generation later the Grammar Schools Act of 1840 overruled the decision and enabled the court to widen the curriculum, but only by the expensive process of a lawsuit. It took another generation before by the Endowed Schools Act, 1869 (*q.v.*), a body of Endowed Schools Commissioners was instituted to create more or less popularly elective governing bodies and to introduce natural science and modern languages. This had to be done by separate schemes in each case, frequently opposed in Parliament on political grounds. But now there are many grammar schools, in which grammar forms a very small part of the whole curriculum, which do not teach Greek at all, and in which it is even possible to escape Latin altogether. On the other hand, those which have been most successfully reformed in their government and have in view the preparing of boys for the universities retained a greater but more efficient instruction in classics, such as Sherborne in Dorsetshire, Sedbergh in Yorkshire, two of the earliest of the so-called Free Grammar Schools of King Edward VI, Derby and Ipswich, have dropped the word "grammar" and in imitation of Rugby, which was one of the earliest to do so, call themselves simply Sherborne or Sedbergh School, after the name of their place, and would describe themselves as Public Schools (*q.v.*), almost in contradistinction to grammar schools. The latter term, however, has been retained, and is still used in schools in some of the great manufacturing towns like Leeds and Manchester. A. F. L.

See articles on individual schools, *e.g.* ETON; HARROW; ST. PAUL'S; PUBLIC SCHOOLS; ENGLAND, EDUCATION IN, under Secondary Education.

Present Position. — A classification of English secondary schools is a matter of some difficulty. Many factors which are extraneous to education enter in to complicate the question. But the following three broad divisions may be made: (1) Those schools which are known as the Public Schools *par excellence;* most of these will receive separate treatment (*e.g.* Winchester, Eton, Harrow, Rugby, etc.). And since the Public Schools have established a tradition, an account of their general organization and spirit will be given under PUBLIC SCHOOLS. (2) A wide middle division including day and boarding schools, some accepting a government grant, some not, all charging fees, and the majority developed out of old foundations. (See ENDOWMENTS; ENDOWED SCHOOLS ACT.) (3) The third class of schools consist of those recently founded and maintained by local authorities and supported by government grants, taking pupils as a rule direct from elementary schools and keeping them for about four years. For these see ENGLAND, EDUCATION IN.

Here only those schools which fall into the second division are treated. Generally these schools are attended by the children of the middle classes, and with the exception of those who hold scholarships or free places all pupils pay fees which vary in amount from £12 to £24 in day schools and £75 to £120 in boarding schools. While it has been found convenient to group these schools under the caption of Grammar Schools, the titles vary widely. With many the term "College" has found great popularity in imitation of true collegiate schools like Eton (see, however, COLLEGE, ENGLISH); others merely bear the place name, and others again retain the title of Grammar School. The organization of all the schools is approximately the same. While some may receive pupils at the age of nine or ten, secondary work generally begins at the age of twelve, the pupils receiving their preliminary education in elementary or in special preparatory schools, and continues up to nineteen, although there is usually a great leakage at sixteen. The schools are usually divided into modern and classical sides; the former prepares boys for practical and commercial life as soon as they leave school, or in some cases for the universities, the latter for the universities and the professions. In some schools all pupils receive a common basis in a "junior school," and bifurcation takes place in the senior school at the age of thirteen or fourteen. In a few cases provision is made for special science and mathematical sides, for special preparation for army examinations, etc. The schools are organized in forms (*q.v.*), generally on a basis of six, and each form is under a form master who has general charge of pupils in his class, while for certain subjects, such as science and mathematics, there are specialists. For the influence of examinations on the work of English schools, see under that topic. For the social organization see ATHLETICS, EDUCATIONAL; BOARDING SCHOOLS; DORMITORIES; PUBLIC SCHOOLS; FAGGING; PREFECTS; STUDENT LIFE; etc.

The following schools taken from the *Public Schools Yearbook* (1911) may be regarded as representative. The basis of selection is the same as for membership of the Headmasters' Conference — namely, number of pupils in the school (one hundred boys at least), number of former pupils resident as undergraduates at Oxford and Cambridge (ten at least), and number of boys sent up to the universities annually (five or six at least). The nine great Public Schools are left for separate treatment. The dates of foundation in the following list are based on Leach.

	DATE OF FOUNDATION	NUMBER OF PUPILS	NUMBER OF MASTERS
Abingdon School	1563 (refounded)	120	10
Aldenham School	1597	210	17
Beaumont College, Old Windsor	1861	180	35
Bedford Grammar School	1552 (refounded)	800	47
Berkhamsted School	1545	465	22
Birkenhead School	1860	200	10
King Edwards VI's High School, Birmingham	1552	470	27
Bishop's Stortford College	1868	133	14
Blundell's School, Tiverton	1604	250	20
Boston School	before 1327	105	7
Bradfield College	1850	287	27
Bradford Grammar School	before 1548	550	25
Christ College, Brecon	1541	100	7
Brighton College	1845	242	19
Bristol Grammar School	before 1171	380	21
Bromsgrove School	before 1548	140	12
Leys School, Cambridge	1875	155	18
Perse Grammar School, Cambridge	1615	210	23
King's School, Canterbury	598	237	18
St. Edmund's School, Canterbury	1749	125	13
Carlisle Grammar School	before 1290	140	9
Cheltenham College, Cheltenham	1841	600	49
Dean Close Memorial School, Cheltenham	1886	220	13
King's School, Chester	1541	140	9
Chigwell School	1629	100	9
Christ's Hospital, West Horsham	1552	820	47
City of London School	1834	715	36
Clifton College, Bristol	1862	650	51
Whitgift Grammar School, Croydon	1596	335	25
Denstone College	1873	270	17
Dover College	1871	200	18
Dulwich College, London	1619	701	43
Durham School	before 1180 (refounded 1540)	102	13
Eastbourne College	1867	200	17
Epsom College	1855	284	20
Exeter School	1332	130	11
Felsted School	1564	250	21
Fettes College	1886	230	20
Giggleswick School	1507	140	13
Trinity College, Glenalmond	1841	140	14
Elizabeth College, Guernsey	1563	120	11
Haileybury College	1862	490	35
Hereford Cathedral School	1381	120	12
Highgate School	1562	380	25
Gresham's School, Holt	1555	196	17
Hymers College, Hull	1889	260	17
Ipswich School	before 1477	126	10
King William's College, Isle of Man	1833	185	13
Owen's School, Islington	1613	420	26
Victoria College, Jersey	1852	155	13
King's College School, Wimbledon	1829	230	18
Royal Grammar School, Lancaster	before 1472	169	9
SS. Mary and Nicolas College, Lancing	1843	222	21
St. John's School, Leatherhead	1851	255	16
Leeds Grammar School	1552	275	22
Wyggeston Grammar School, Leicester	1515	585	27
Liverpool College	1842	250	17
Llandovery College	1848	161	14
Loretto School	1829	146	18
Malvern College	1864	500	36
Manchester Grammar School	1506 1515	880	45
Marlborough College	1843	600	40
Merchant Taylor's School Crosby	1618	300	15
Merchiston Castle School, Edinburgh	1833	270	23
Mill Hill School	1807	260	22
Monkton Combe School, near Bath	1868	157	17
Monmouth Grammar School	1614	177	12
Newcastle-under-Lyme High School	1602	150	12
Norwich School	before 1256	90	9
Nottingham High School	before 1289	370	20
Oakham School	1584	105	11
Oundle School	1464	340	25
Oxford High School	1878	150	11
Magdalen College School, Oxford	1480	100	10
St. Edward's School, Oxford	1863	120	10
Plymouth College	1854	172	12
Portsmouth Grammar School	1732	230	12
St. Peter's College, Radley	1847	240	20
St. Lawrence College, Ramsgate	1879	206	21
Reading School	before 1125	135	13
Repton School, Repton-on-Trent	1557	360	30
Rossall School, Fleetwood	1844	300	28
St. Alban's School	948	218	14
St. Bees School	1587	280	16
St. Olave's and St. Saviour's Grammar School, London	1571	450	24
Sedbergh School	1525	220	18

	Date of Foundation	Number of Pupils	Number of Masters
Sherborne School . . .	1550 (refounded)	280	21
Stonyhurst College . .	1592	300	26
Tonbridge School . . .	1553	450	39
Trent College	1866	150	15
University College School, London	1830	390	25
Uppingham School . .	1584	440	37
Wakefield Grammar School	1591	250	18
Warwick School, . . .	before 1066	200	15
Wellington College . .	1853	490	36
Weymouth College . .	1863	115	12
Wolverhampton School .	1515	260	16
Woodbridge School . .	1662	144	12
Worcester Cathedral King's School . . .	1540	150	14
Worcester Royal Grammar School	before 1292	275	17
St. Peter's School, York .	8th century	146	19

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Schoolmasters' Yearbook, giving a chronicle and review of the year (bearing on secondary education) and general information. (London, annual.)

GRAMMAR, STUDY OF. — See GRAMMAR, ENGLISH; ENGLISH USAGE; GREEK LANGUAGE AND LITERATURE; LATIN LANGUAGE AND LITERATURE.

GRAMMATEUS (Heinrich Schreiber, or Henricus Scriptor, whence the Latinized Greek form of Grammateus).— Mathematician; was born at Erfurt, at least as early as 1496, and describes himself in one of his works as *Henrich Grammateus von Erfurt der siben freien künsten Meyster.* He was a student at Cracow and at the University of Vienna (1507), and was well known as a teacher, and also as a lecturer in the university where he was educated. His publications include an arithmetic, *Rechenbüchlin*, that appeared in 1518, with subsequent editions in 1535, 1544, 1554, and 1572. He also published the following: *Algorithmus proportionum*, in which was included some work in the theory of music (Cracow, 1514); *Libellus de compositione regularum pro vasorum mensuratione* (Vienna, 1518); *Behend und khunstlich Rechnung nach der Regel und welhisch practic* (Nürnberg, 1521); *Algorismus de integris Regula de tri cum exemplis* (Erfurt, 1523); *Eyn kurtz newe Rechenn unnd Visyrbuechleynn* (Erfurt, 1523). Rudolff (*q.v.*) learned algebra from Grammateus, for he records his thanks to him in these words: *Ich hab von meister Heinrichen so Grammateus genennt der Coss anfengklichen bericht emphangen. Sag im darumb danck.* D. E. S.

GRANADA UNIVERSITY. — See SPAIN, EDUCATION IN.

GRAND ISLAND COLLEGE, GRAND ISLAND, NEB. — A coeducational institution maintaining academic, collegiate, commercial, and music departments. The entrance requirements to the college are equivalent to the work of a high school. The college confers the degree of A.B. on completion of the requisite courses. There is a faculty of twenty-five instructors.

GRANGER, THOMAS. — Writer of a Latin grammar, 1616, and a logic, 1620. . The grammar is entitled: *Syntagma Grammaticum, or an easie and methodicall explanation of Lillie's Grammar; whereby the misterie of this Art is more plainly set forth, both for the better helpe of all schoole-maisters, in the true order of teaching, and the schollers far more easie attainement of the Latine tongue,* 1616. Granger was an M.A. of Peterhouse College, Cambridge, apparently minister at Butterwick, near Boston, in Lincolnshire. His grammar is of importance on account of the Epistle to the Reader, containing " the generall Theorike, or true grounds of teaching." In this treatise Granger points out that commonly doubtfulness and confusion exist in teacher and scholar, unless he is full master of his subject and understands child nature. Granger has a clear insight into the causes of confusion and doubtfulness in the child. He understands that the psychology of the child is different from that of the man, and goes on to point out the differences in a very modern spirit. Granger anticipates something of the doctrine of self-activity. " The scholar must attain to learning by his own study, industry, diligence and exercise, *using his master as a help, as a nurse, or matrice.*"

In 1620 Granger published *Syntagma Logicum — or the Divine Logike.* This was a logic for divines in " the practice of preaching " and for the help of " judicious hearers " and " generally for all." It is dedicated to Bacon. The work is founded on Ramus (*q.v.*), the great reformer of logic, with modern applications. Granger supplies scriptural and theological illustrations of logic, as Fraunce (*q.v.*) had supplied English poetical and legal illustrations. F. W.

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GRANT, CHARLES (1746-1827). — Statesman and philanthropist, born in Invernesshire. He was early taken by an uncle to India, where he entered the service of the East India Company, with whom he attained a position of great importance and influence. He interested himself greatly in the need for the social betterment of the natives, and never tired of sending to England suggestions for the increased establishment of missions in India. On his return to England he was instrumental in founding the Church Missionary Society (1799) and the British and Foreign Bible Society (1804). His treatise, *Observations on the State of Society among the Asiatic Subjects of Great Britain particularly with Respect to Morals; and on the Means of Improving it* (1813), led to the appointment by Parliament of a Bishop of Calcutta with jurisdiction over India and Ceylon, and to the grant of a lac of rupees ($50,000) for promoting education. He drew attention, also, to the need of industrial training in India. Grant was also the originator of a plan for the education of young civil servants of the East India Company, which resulted in the establishment in 1805 of the East India College at Haileyburg. (See PUBLIC SERVICE, TRAINING FOR.) He sat in Parliament from 1802 to 1818 as member for his native county.

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GRANT, ZILPAH. — See BANISTER, ZILPAH GRANT.

GRANTHAM, THOMAS (d. 1664). — A clergyman who on sequestration of his parsonage became a private schoolmaster, an advocate of a speedy way of teaching the Hebrew, Greek, and Latin tongues, and the determined opponent of corporal punishment. He appears to have belonged to a Lincolnshire family and to have studied at Oxford from 1628 to 1630 and at Cambridge (Peterhouse, M.A. 1634). Before 1644 he was teaching in Bow Lane, and wrote his *Brainbreakers Breaker* (Μνημοφθοροπαίκτης) in which he protests vigorously against the severity of schoolmasters. Grantham gives a picture of the school teaching of the times, in which he attacks the weakness of teaching grammar by rote in an unintelligible language. Grantham sought to teach grammar rules understandingly "and by often applying them, the rules come without book whether they will or no." Still more remarkable was Grantham in his *Brainbreakers Breaker newly broke out again* in 1649–1650. In it he says: "A boy may easily learn a thousand words in ten days, that is, a hundred words in a day." Grantham proposes as remedy that all the revenues of the free grammar schools should be taken from them and placed in the hands of a treasurer, and only those schoolmasters who proved their ability to teach well should receive the public money. On one occasion, one of Grantham's challenges against a London public school was accepted and judgment given in favor of Grantham.

Grantham also wrote *Animadversions on Camden's Greek Grammar*, dealing with his favorite topic of the folly of learning grammar by rote; and in 1644 he wrote *A Discourse in Derision of the Teaching in Free Schools and other common Schools*, in which he introduces three ordinary masters of Free Schools, a citizen, a country gentleman, a traveler, and himself, "Professor of the Greek and Latin Tongues in London." In 1660 he translated three books of Homer's *Iliad* into English. F. W.

Reference: —

Dictionary of National Biography.

GRANTS. — See APPORTIONMENT OF SCHOOL FUNDS; BUDGET, SCHOOL; NATIONAL GOVERNMENT AND EDUCATION; SCHOOL FUNDS.

GRAPH. — A term used in algebra to refer to the representation of an equation by the methods of analytic geometry (*q.v.*), and occasionally to refer to other line and surface representations of functions. The introduction of this topic into elementary algebra is recent. As in all such cases, there have been three periods in this introduction: (1) the period of adoption for the purpose of filling the gap left by the omission of some obsolete topic; (2) the period of extravagant and ill-considered use of a novelty; (3) the period of reaction and of investigation of the real merits of the theory. From the educational standpoint the greatest value of the graph lies in its power of showing visually the number and nature of the roots of an equation. For elementary purposes, as a means of finding the actual roots of an equation, its value is slight, although in the computation of the roots of a numerically higher equation it has of late been shown to be very useful. Its value in showing the functional relation of algebraic expressions is also great, and is coming to be recognized.

In elementary algebra it is desirable to introduce curve tracing as an aid in the study of the negative number. This work also offers an opportunity of showing the change in a function of a variable as the variable changes. It may next be introduced in connection with the study of simultaneous equations of the first degree in two variables. Here there are four types that may advantageously be considered: (1) Two simultaneous equations such as $x + 7y = 15$, $9x - 3y = 3$. In this case the lines will intersect, and the result is a visual illustration of the fact that two such equations have, in general, a root, and that only one root is possible. (2) Two inconsistent equations such as $6x - 9y = 7$, and $4x - 6y = 5$. In this case the lines will be parallel, and the student sees that there is no point in common, and hence that two such equations in two unknowns are not necessarily simultaneous. (3) Two identical equations, such as $6x + 9y = 12$, and $4x + 6y = 8$. Here the two lines are identical, and the student sees that there is an infinite number of points on the two lines, and hence that there is an infinite number of values of x and y that will satisfy the two equations. (4) Three or more simultaneous equations in two unknowns, such as $x + y = 5$, $2x - y = 1$, $7x + 4y = 26$. Here the three lines pass through the common point (2, 3), and the student sees that in general three such equations have one common root, but that in a special case the lines may be concurrent and the equations indeterminate. The next use of the graph is found in the study of quadratics. Here the use is twofold: (1) In the study of a single quadratic equation in one unknown, the graph shows clearly the number of roots to be expected, the fact that imaginary roots enter in pairs, and the meaning of equal roots. (2) In the study of two quadratics involving two unknowns, or of one quadratic and one linear equation, the graph shows the number of roots to be expected, and the possibilities as to the nature of the roots. For example, a straight line cuts a conic in two points, and hence we expect two roots in solving a system consisting of a quadratic and a linear equation. Two conics, however, intersect in four points, and hence we expect four roots. The graph shows how two of these roots may be identical (the conics being tangent), or how two imaginaries may enter at the same instant, and all this makes an impression on the student's mind that the mere analytic proof does not make.

Used in this spirit, a reasonable study of graphs is desirable. Carried beyond these limits, the work usually degenerates into a formalism without object and without real interest.

D. E. S.

GRAPHIC CURVE. — A term applied to a line the characteristics of which indicate to the eye the relationship which two variable quantities sustain to each other as either the one or the other is increased or diminished. In order to determine this curve, two lines of reference, called axes, are drawn perpendicular to each other. A number of corresponding values of the two variables are obtained, and for each pair of values a point is plotted, the perpendicular distances of which from the two axes are representative of each of the two variables in that calculation. After a number of such points are plotted, it is usually possible to draw through them a line which will indicate the general character of the relationship between the variables involved. One of the best known of the graphic curves is that illustrating Weber's law, or the psychophysical law of the relationship between the intensity of stimuli and the intensity of corresponding sensations. It is found that in order to get any sensation at all the stimulus must be considerable. After this, as the stimulus is increased, the intensity of the sensation increases at first very rapidly, then more slowly, until at last further increase in the stimulus produces no result on the intensity of the sensation. In general, in order to produce an appreciable increase in the intensity of the sensation the intensity of the stimulus must be increased by a certain proportion of itself. The law may be pictured by the following graphic curve (Fig. 1). Distance measured on *OX* indicates intensity of stimulus. Distance measured on *OY* indicates intensity of sensation. Intensity *Ob* of stimulus corresponds to intensity *Oa* of sensation. Both are represented by point *p* on the curve. The curve in general resembles a parabola.

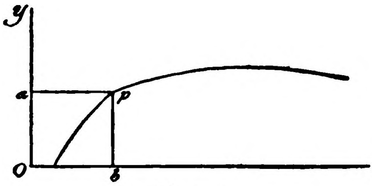

Fig. 1.

Graphic curves may vary from straight lines to curves of great irregularity. One of the simplest types is the *curve of distribution*, brought into prominence in psychological statistics by Sir Francis Galton (*q.v.*). It represents the number of individuals of a group who represent each of the various existing differences in reference to any characteristic. For example, in a given fairly homogeneous population, there will be very few very short men, very few very tall men, and, as we approach the average height from either extreme, the number of individuals who correspond to the successive measurements will at first increase slowly, then more rapidly. The general form of the normal curve of distribution is as follows (Fig. 2): Distance measured on *OX* indicates the amount of the characteristics in question. Distance measured on *OY* indicates number of individuals.

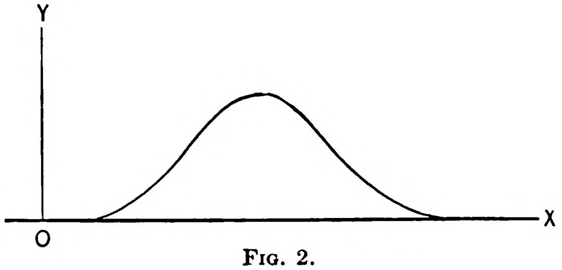

Fig. 2.

In reference to such distributions three values are of importance. These are the *average*, which is obtained by adding all the measurements together and dividing by the number of individuals concerned: the *median*, which represents the measurement above or below which 50 per cent of all the individual measurements lie, and the *mode*, or the measurement represented by the greatest number of individuals. It is interesting to note that average, median, and mode may in the same case represent different values, a fact which the form of the curve will readily display.

If a population, instead of being homogeneous, is divided, for example, into two groups which vary considerably from each other in reference to the trait in question, this fact will be shown by a deviation from the normal curve of distribution. A population made up of two races, one considerably taller than the other, would be apt to be represented by a curve sagging at the center, as in Fig. 3. Here the modes *m*

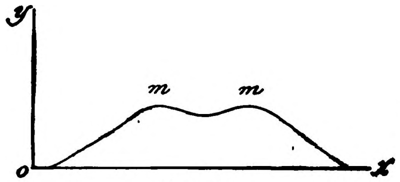

Fig. 3.

and *m'* of the two racial groups would vary considerably from each other, producing the effect indicated.

Again, if some selective agency tends to destroy those who vary either above or below the normal, the curve will exhibit this influence by falling off abruptly on the side affected, and

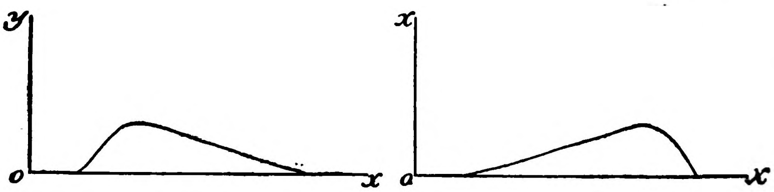

Fig. 4.

representing what is known as a skew distribution, as in Fig. 4.

Another simple type of graphic curve may be called the *curve of fluctuation.* In this the measurements on one axis represent intervals of time, while those made on the other represent the fluctuating values. The rate of growth in height or weight or of advance in any mental trait may thus be represented to the eye. Here the curves tend in one direction, but where health or school attendance or amount of improvement is represented, they are likely to rise and fall.

Correlation. — Both the curve of distribution and that of growth or fluctuation indicate correlation. In the one case, a measurement is correlated with the number of individuals who represent it; in the other, with the time of occurrence of the fact that it indicates. The special character of the two curves differentiates them from the curve which represents the relation of two characteristics without reference to number of individuals or time of occurrence. This curve may, therefore, not inappropriately be given the title *curve of correlation.* The curve illustrating Weber's Law is an example of this type.

To plot a curve of correlation one trait must be taken as a basis, and the individuals representing successive measurements in this trait must be grouped together. Then the average measurement of each group in respect to the other trait must be found. These successive averages must then be plotted and the curve drawn through them. It is evident that the curve will progress regularly in the direction of increase in the basal trait. Ordinarily such regular progress will not be discovered in reference to the averages representing the second trait. Thus the curve will fluctuate as in Fig. 5. While in general there is progress in reference to the averages of the second trait, this progress is not uniform. Careful reflection, however, will make it evident that if enough cases are obtained the irregularities will be likely to disappear and that we shall have left a curve or straight line which will indicate the amount and character of the correlation or the lack of correlation between the two traits in question. Suppose, for example, the correlation between ability in mathematics and ability in classics were being calculated. Let degree of mathematical ability be measured on OX, where O represents the minimum and X the maximum ability. Let degree of ability in classics be measured similarly on OY. Perfect correlation between the two powers would be represented by Fig. 6. Every individual will occupy the same relative position in reference both to mathematical and to classical ability. On the other hand, if there be no correlation, every group in reference to mathematical ability would in classical ability tend to show about the same mediocre average. The curve would then be parallel to OX, as

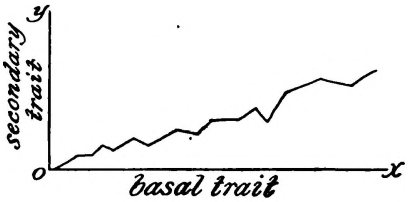

Fig. 5.

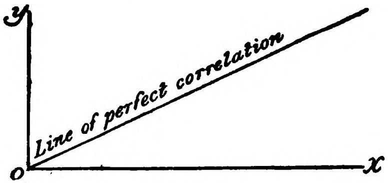

Fig. 6.

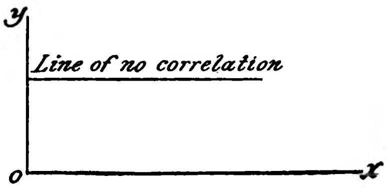

Fig. 7.

indicated in Fig. 7. A curve of partial correlation would be represented in Fig. 8; of perfect reverse correlation in Fig. 9. Here as one ability increases, the other diminishes.

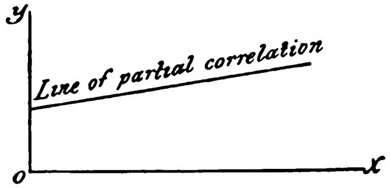

FIG. 8.

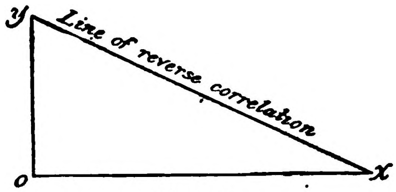

FIG. 9.

Average Deviation. — It is evident that except where there is perfect correlation the curve does not enable us to place any individual in regard to one trait when his position in regard to another is known. When, however, the average deviation of the individual measurements from the averages that are represented by the curve are calculated, approximate prediction becomes possible. We can say that the chances are even that the position of any individual in one trait will not vary more than the amount of the average deviation from the place in the curve which is assigned to it by virtue of its rating in reference to the other trait.

The accurate determination of degrees of correlation is a matter of somewhat complicated mathematical analysis. For an adequate treatment of this subject the reader is referred to Thorndike's *Mental and Social Measurements*. The graphic curve is not intended as a basis for predictive calculation, but rather to exhibit a relationship in a form readily to be apprehended. It is evident that for this purpose it has great value in educational theory and practice. In this field the calculation of distribution and variation, of growth and fluctuation, or of correlation, whether in reference to mental or physical abilities, the effects of this or that educational method or condition, of school practices, or of a multitude of other factors concerned in education, is being recognized as of the greatest importance. In order to display the results of these calculations in a form easily grasped, the graphic curve is of very great value.

It is interesting to note that the use of axes of reference by relation to which the corresponding values of two variables can be determined was invented by Des Cartes (*q.v.*) as a means of applying algebra to geometry. The coördinate geometry reduces a visible geometric form to an abstract quantitative relationship. The graphic curve reverses this process, and puts the abstract quantitative relationship in a concrete visible geometrical form. E. N. H.

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GRAPHIC REPRESENTATION. — See GRAPH; GRAPHIC CURVE; VISUAL AIDS TO TEACHING.

GRAPHOLOGY. — The science of handwriting. This science has never been developed in any systematic form, and it is doubtful whether it can be so developed. The effort of many to judge character through writing has never been successful. Certain characteristics of writing can, however, be recognized as related to well-defined conditions under which the writing is done. C. H. J.

See PENMANSHIP; WRITING.

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GRASER, JOHANN BAPTIST (1766–1841). — A distinguished German educational writer, born in Eltman, Bavaria. He studied in Bamberg and Würzburg, where at the age of twenty he became doctor of philosophy. He entered the priesthood, and was appointed prefect of the theological seminary at Würzburg. After some experience as teacher and university professor he went in 1804 to Bamberg as school councillor (*Schulrat*). In 1810 he was transferred to a similar position in Bayreuth, which he filled up to the time of retirement in 1821. A monument was erected to him in Bayreuth by the teachers of Upper Franconia.

Graser's pedagogical theory was based on the philosophy of Schelling. He considers as the chief aim of education the development of the "divinity" in man. Education should make man conscious of his divine origin, and should cause him so to think and act as to make himself worthy of this origin. Graser also deserved credit for the introduction of a new method of elementary instruction by which reading and writing were taught together (*Schreiblesemethode*). The observations which he made in the teaching of reading directed his attention to the education of deaf-mutes. Through his efforts courses for the instruction of deaf-mutes were introduced in many German teachers' seminaries. Graser's chief works are:

Divinität oder das Prinzip der einzig wahren Menschenerziehung (*Divinity, or the principle of the only true human education,* 1830); *Elementarschule fürs Leben* (*Elementary School, a preparation for life,* 1831); *Der durch Gesicht und Tonsprache der Menschheit wiedergegebene Taubstumme* (*The deaf mute restored to humanity through visual observations and oral language,* 1829). F. M.

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GRAY, ASA (1810–1888). — Scientist and textbook author; was graduated at the Fairfield College of Physicians and was professor in Harvard College from 1842 to 1873. Author of textbooks in botany and physiology. W. S. M.

GRAY, THOMAS (1716–1770). — Poet and scholar; he showed remarkable versatility, although in his student days he chafed so strongly against academic regulations and prescriptions as to leave Cambridge without a degree. Botany, zoölogy, history, language, archæology formed the chief subjects of his studies. His most interesting contribution on education was the poem, *The Alliance of Education and Government,* which was unfortunately never finished. In it the poet pleads for "the necessary alliance between a good form of government and a good mode of education" (Mason). Apparently Gray abandoned the poem because he found a much better treatment of the subject in Montesquieu's *L'Esprit des Lois.* The introduction of this poem, like several stanzas of the *Elegy Written in a Country Churchyard,* is a plea for educational opportunity for the "village Hampden" or the "mute, inglorious Milton."

> But Knowledge to their eyes her ample page,
> Rich with the spoils of time, did ne'er unroll.

Gray's first printed poem was the *Ode on a distant Prospect of Eton College,* which, while giving a picture of the Eton of his day, takes at the same time a somewhat pessimistic view of the joy and carelessness of youth, ignorant of the world before them.

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GRAZ, THE IMPERIAL ROYAL CHARLES-FRANCIS UNIVERSITY OF. — Like several other Austrian universities, the University of Graz, located in the capital of Styria, owes its origin to a Jesuit College, the college at Graz having been founded in 1573 by Archduke Charles. Soon afterwards a Latin school was added to the college, this step being followed in 1585 by the organization of a university, which was formally opened in the following year, and remained under the control of the Society of Jesus until the dissolution of the Jesuit order under Empress Maria Theresa in 1773. The institution consisted at first of only two faculties, those of theology and philosophy, although the Jesuit College was looked upon as a separate *Facultas humanistica sive linguarum.* The original university building was completed in 1609, and remained in use until 1895, when a new building was dedicated. The first professorship in medicine dates back to 1774, and five years later a faculty of law was established. Emperor Joseph II lowered the tone of the institution, which by 1713 boasted of an enrollment of 1350 students, by degrading it into a lyceum, as a result of which the student body diminished rapidly in numbers until the university privileges were restored in 1826. The faculty of philosophy was reorganized in 1849, the medical faculty fourteen years later, the university at the present day possessing the traditional four faculties, the theological faculty being of course Catholic. There were 2074 students in attendance in the winter semester of 1909–1910, of whom almost half were enrolled in the faculty of law. The University Library, founded in 1586, contains about 250,000 volumes and almost 2000 manuscripts. Graz is also the seat of an Imperial Royal Technical School, which attracted 725 students in the winter semester of 1909–1910. R. T., Jr.

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GRÉARD, CLEMENT VALLERY OCTAVE (1828–1904). — French educator, born at Vire, and a friend of Prévost-Paradol. He was appointed an academy inspector by Duruy (*q.v.*), director of education in the department of the Seine, by Baron Haussmann, and vice-rector of the Academy of Paris by Jules Ferry to succeed Ad. Mourier. He devoted himself to realizing in administration the greater part of the reforms elaborated and the progress begun by the great ministers of public instruction. Retiring in 1902, he died in 1904. Gréard was an administrator ready to put into practice the instructions of all the ministers, anxious for his reputation and standing; a man of energy, he could at times exercise, as a teacher expressed it, the suppleness of an Italian cardinal. In elementary education he demanded orderliness in buildings and equipment, proper care of the pupils' exercise books, methodical instruction, etc. In the secondary field he strove to apply to the *lycées* for girls some of the ideas of Fénelon and Madame de Maintenon, and in the *lycées* for boys he took as his guide the reforms suggested by H. Marion (*q.v.*). Opposed on principle to the boarding school, which he accepted as an administrator, he tried to establish some *lycées* in the country round Paris; the attempt failed within the University, but succeeded outside.

The chief works of Gréard are *Le Morale de Plutarque* (1866); *Lettres d'Abélard et d'Héloise* (1868); *L'Organisation pédagogique des Écoles de la Seine* (1868); *L'Instruction primaire à Paris* (1871); *La Législation de l'Enseignement primaire en France depuis* 1789 (1900); *L'Enseignement secondaire des Filles* (1887); *Éloge de M. de Falloux* (1888); *Éducation et Instruction* (1888 and 1900), etc. J. P.

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GREAT BRITAIN. — See ENGLAND, EDUCATION IN; IRELAND, EDUCATION IN; SCOTLAND, EDUCATION IN; WALES, EDUCATION IN.

GREAT DIDACTIC. — See COMENIUS.

GREATEST COMMON DIVISOR. — The greatest number that will divide two or more given numbers, producing an integral quotient, is called their greatest common divisor. Formerly the greatest common divisor had a prominent place in the teaching of arithmetic, but now this position has been lost, the subject having value only in the theory of numbers (*q.v.*). The reason for its former prominence is easily seen when we consider the nature of the common fraction of the Middle Ages and early Renaissance. (See FRACTIONS.) For example, in reducing a fraction like $\frac{2257}{3599}$ to lowest terms, for the purpose of operating with it or of expressing some result in simpler form, the factors to be suppressed are not at once evident. It therefore becomes necessary to find the greatest common divisor by a form that is given in Euclid's *Elements,* and therefore known as the Euclidean method. This is illustrated in the following operation: —

```
2257)3599(1
     2257
     ----
     1342)2257(1
          1342
          ----
           915)1342(1
                915
                ---
                427)915(2
                    854
                    ---
                     61)427(7
                        427
                        ---
```

The proof that 61 is the greatest common divisor of 2257 and 3599 depends upon two principles: (1) A divisor of any number is a divisor of any multiple of the number; (2) A common divisor of each of two numbers is a divisor of the sum or the difference of any multiples of the numbers.

Educationally the subject has lost its significance, since the general acceptance of the decimal fraction. The common fraction now being limited to simple forms, we no longer need to reduce difficult fractions to lowest terms, at least in ordinary business and science. The mere suppression of factors by inspection suffices for such cases of reduction as practically occur. This being the case, it is somewhat absurd that greatest common divisor should be taught by factoring, as is commonly the case at present. Since the only time when we practically need to use the greatest common divisor is when we cannot readily factor two numbers, to find the greatest common divisor by factoring is to find it under conditions that are never met. If we can easily factor, we can cancel factors from the terms of a fraction without taking the trouble to find the greatest common divisor. For this reason the subject will probably disappear from arithmetic in the next generation.

The corresponding expression in algebra is highest common factor. We cannot tell whether a given algebraic expression is greater than another unless we know the numerical value of the letters. For example, x^2 is greater than x if the absolute value of x is greater than 1, even though its algebraic value may be less than 1, as in the case of $x = -2$. But x^2 is less than x, if the absolute value of x is less than 1, as in the case of $x = \frac{1}{2}$. Hence the word "highest" is used instead of *greatest,* referring to the degree rather than the absolute value of the expression. The remarks already made concerning the greatest common divisor in arithmetic apply to quite an extent to the highest common factor in algebra. Although there is no algebraic decimal fraction to replace the common fraction, as there is in arithmetic, nevertheless the practical uses of the highest common factor were formerly much exaggerated. Hence the subject is at present given less attention than was formerly the case.

D. E. S.

GREAVES, JAMES PIERREPONT (1777-1842). — English Pestalozzian, acquired a competence as a merchant, but lost his property by French spoliations during the Napoleonic wars. Through his interest in philanthropic movements, he joined Pestalozzi (*q.v.*) at Yverdon in 1817 in order that he might familiarize himself with the best means of educational reform. A year later he took charge of the coeducational orphan school which the Swiss reformer had organized at Clendy, near Yverdon. Greaves returned to England in 1825 and became secretary of the Infant School Society (*q.v.*) of London. At his request Pestalozzi wrote him a series of letters on the education of the child, which he translated and published in English. (*Letters on the Early Education of the Child*, London, 1827.) In 1832 he settled at Randwick, Gloucestershire, and engaged in a scheme for the improvement of agricultural laborers, similar to that which Pestalozzi had originated at Neuhof in 1769; and five years later he founded at Ham, near London, a Pestalozzian school, which he named Alcott House, in honor of A. Bronson Alcott (*q.v.*), the American Pestalozzian. He shared the transcendental views of the American philosopher and invited him to England. He founded the Æsthetic Society of England, and in various ways engaged in reform movements in education. W. S. M.

See PESTALOZZIAN MOVEMENT.

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GREECE, EDUCATION IN ANCIENT. — The education of the Greeks was to a peculiar degree the embodiment of an attitude of life, the practical application of a theory of value which was taking shape from the age of Homer to that of Aristotle. It is proposed, first, to trace the growth of this theory of values to a theory of education; secondly, to sketch the views of education laid down by Plato and Aristotle; and then, with the Greek point of view thus determined in a measure, to describe Greek education in its actual working.

Stated briefly and generally, Greek education was based on certain essentially Hellenic characteristics that are at least as old as Homer and Hesiod, — a keen delight in physical strength, skill, and beauty, a belief in reverence, moderation, and social obligation or justice, and a feeling for form, not as form, but as expression. The delight in bodily beauty and effectiveness is sufficiently illustrated by the games at the funeral of Patroclus (*Iliad* XXIII), by the festivals — to name only the greatest — at Olympia, Delphi, Nemea, and the Isthmus (see the *Odes* of Pindar). The ideals of reverence, moderation, and justice, presented more or less dimly in Homer and set forth clearly in the *Works and Days* of Hesiod, are at the very basis of the Spartan system of education. The Greek emphasis on form as selective expression was not explicitly stated as a conscious attitude until the fourth century; yet it is inherent in every line of poetry chanted or sung from Homer to Sophocles, and in every vase painting from the geometric period to the fifth century.

Even in Homer there are signs of the coming end of the extreme individualism — good in its fearless spontaneity, bad in its half savage indifference to law — which forbade any conscious effort to attain a real social ideal through education. Individualism is definitely limited by Hesiod to emulation. The *Works and Days* sets forth a clear social ideal based on justice and its corollary, moderation, or self-restraint. And the educational system traditionally ascribed to the Spartan Lycurgus (*c.* 800 B.C.), while unique in that it aimed at the perpetuation of the military supremacy of a conquering race, was in its most fundamental features a definite application of the principles set forth in Hesiod, — self-restraint, subordination of individual aims and desires to those of the social group, and an essentially moral training through precept, practice, example, and emulation. The wild freedom of Homer had given place to law. Individualism had given place to socialism. And to a greater or less degree this was increasingly characteristic of the whole movement of the Greek world from the ninth century to the fifth. But intense as the social feeling, the city patriotism, became in all of the Hellenic cities, it was usually less extreme than in Sparta, and was balanced both by a stronger individualism in political life and by a keen delight in such individual expression as was afforded by music, literature, which was hardly differentiated from music, and art. Gymnastics, while doubtless the object of special emphasis in the soldier state of Sparta, continued to be regarded with enthusiasm by Dorians and Ionians alike. Gymnastics and music were indeed the objects of a devotion never accorded to what we often regard as the typical Greek art of sculpture. Yet underlying all of these was the feeling expressed in the Delphic motto " Nothing in excess," the practical expression of that idealism which was the fundamental characteristic of the Greek attitude to life, the search for the essential in all things, the ruling out of everything irrelevant and inharmonious.

Educational Theory. — Education in Sparta aimed simply at the development of soldier citizens, trained to the utmost physical effectiveness and to such moral and intellectual virtues as would make for the perpetuation of Sparta as a military power. This was attained by a varied and effective gymnastic training, games, and contests that tested endurance, judgment, self-control and resource, music that inspired to valor and constancy, grave discussions of moral issues, above all by a barrack life of strict discipline and division into companies captained by the older boys. Important as was the training of the body in the system of Lycurgus, it is a mistake to regard it as fundamental. The essential aim of Spartan education was moral. And so absolutely could the Spartans rely on the result of this training that they could even include the art of successful stealing in their curriculum, believing that while the training in resourcefulness and judgment was a positive gain, any resultant disregard for the rights of others would be overwhelmingly outbalanced by the intensely moral and social character of the system as a whole.

So absolute a system of prescription, though admired by individual Athenians, like Plato and Xenophon, was quite alien to the free spirit of Athens. Their education was from the first a private affair, though custom prescribed a fairly uniform curriculum consisting of letters, music, and gymnastics, with a minimum of arithmetic, astronomy, and geometry. Athenian educational theory was formulated tentatively in the fifth century, definitely in the fourth; and as an interpretation of practice, an effort to give a rational account of existing facts in order to see the goal more clearly, it needs to be understood before the details of educational practice are approached. Not that we can separate theory and practice in any hard and fast way. The first definite statement of the aims and methods of Athenian education is indeed a description of practice, and is only theory in so far as it is an attempt to view the situation as a whole in relation to an ultimate aim. This is the description which Plato puts in the mouth of Protagoras as part of his argument for the possibility of moral education. " Education commences in the first years of childhood, and lasts to the very end of life. Mother and nurse and father and slave-tutor (pedagogue) are quarreling over the improvement of the child as soon as he can understand them; at every turn they expound to him that this is just and that is unjust; this honourable and that the reverse; this holy and that impious, and generally, do this and avoid that. And if he obeys, well and good; if not, he is straightened out with threats and blows, like a piece of warped wood. At a later stage, they send him to teachers and enjoin them to see that his manners are good, even more than his reading and music, and the teachers do their best. And then, when he can read, they give him the works of great poets which he reads at school, where he finds many tales and admonitions, and praises of ancient famous men, which he learns by heart in order that he may desire and emulate them. Then again the teachers of the lyre take care that he does not fall into mischief, and introduce him to the poems of other excellent poets, who are the lyric poets; these are set to music, and their tunes and rhythms made familiar to children, in order that they may be more gentle, and harmonious and rhythmical, and so better fitted for speech and action; for the life of man in every part has need of music and rhythm. Then they send him to the master of gymnastics, . . . to fit him for war. This is what is done by the richer or higher classes whose education lasts far longer than that of the rest. Lastly, when they are grown up, the State compels them to learn the laws, and live according to them." (*Prot.* 325–326).

The supreme interpretation of Athenian education was that of Plato himself. The system of education described in the *Republic* is devised only for rulers, and for rulers of an ideal, not an actual, state. But the curriculum is not essentially different from that which regularly prevailed in Athens, and the whole system, theoretical in that it endeavors to determine a rational ideal and a rational method, is practical in that it is soundly based on existing practice. Plato's conception of the aim of education is stated in the seventh book of the *Republic.* In the famous parable of the Cave he shows men living in darkness, seeing only shadows on the wall before them, and taking these shadows for realities. Let one of these cavemen be brought suddenly to the light of day and he is dazzled, blinded, thankful if he can escape to the Cave once more from the light which to him is darkness. But let him be taken more gradually to the outer world, and his eye will gain power to see, and the real world will at last dawn upon him in its infinite grandeur. Here, then, is the function of education, — to turn the eye of the soul to the light in order that it may see and love truth (*Republic,* 518). The sun in the physical world is the type of that fundamental reality which makes everything else intelligible, and knowledge of this fundamental reality — called by Plato the Idea or Form of Good — is of all things the most precious, the goal of every true student. For Plato's Idea is simply the essential, — what is meant when we use the words law, principle, essence; that is, everything which makes it intelligible. He applies to education that which is the keynote of Greek thought and Greek art, — insistence on the fundamental, the universal, and indifference to the accidental, the narrowly individual.

Plato's system of education represents an effort to attain this ideal — the understanding and adoption in life of those things that are fundamentally true and therefore of fundamental value. His general treatment rests on two fundamental presuppositions: (1) that education is of fundamental importance to the State (*Republic,* 425. " The bent given by education will determine all that follows.") and should therefore be required and controlled by the State; (2) that man is an organism, *i.e.* that he is endowed by nature with certain powers which will develop, if the proper conditions are given, and that the teacher's profession is not unlike that of the gardener. These two premises being assumed, Plato outlines a system of training for the young that will stimulate love for what is good and beautiful, dislike of what is bad and ugly, and right action that will become so natural, habitual, and pleasant as harmonious sound is to a musician. This is done through careful choice of literature, both as regards subject matter and form, careful instruction in music, peculiarly important because of the subtly powerful influence of rhythm and harmony on the human soul, and the equally careful effort to have every detail in the child's environment healthy, elevating, and harmonious. To create the right standard of truth and beauty at the outset, before the child is in any way conscious of what is being done, is to make wrong action as repulsive to him as a discordant crash of sounds, and to turn his mind away from the false, the petty, the fleeting, and insignificant as certainly as his eye would turn from the canker worm to the perfect blossom, from the frame to the picture. That a perfect result will follow in every case from even the most wisely devised system of education Plato by no means takes for granted. The imperfect seed will not grow into a perfect flower, and besides, different natures will respond differently and perhaps unexpectedly to similar treatment. There must, therefore, be tests, "labors, vexations, and contests," accompanied by vigilant observation of conduct. Education will thus have its selective side, and only those fitted for it will go on to what we might call the secondary and advanced stages of the course.

For it is necessary that as the child's mind expands and grows in power he should learn to examine his standards and methods of thought for himself. "When reason comes, he will welcome her most cordially who can recognize her by the instinct of relationship, and because he has been (wisely) nurtured"; but it is none the less true that reason must come, and that the growing mind must learn to examine standards, to search consciously for principles, to abstract, question, and generalize. With this in view Plato would introduce his pupils to arithmetic, where they will grow accustomed to the easiest of all abstractions, that of number, to geometry and its problems of space, to astronomy and the laws of rhythm and harmony that control the heavenly bodies. This course of science will lead to philosophy, the study of fundamental truth. And when the student has at last learned to look on beauty and truth in their essential reality, he must turn back to the weary and troublesome problems of actual life in society to serve his fellows as a leader and teacher. His education leads, not to the barren and empty speculation associated with the word "philosophy" by superficial men of the world. Rather are his philosophers wise leaders of men who have learned to see things as they are, to understand and unerringly seize upon the true and the beautiful.

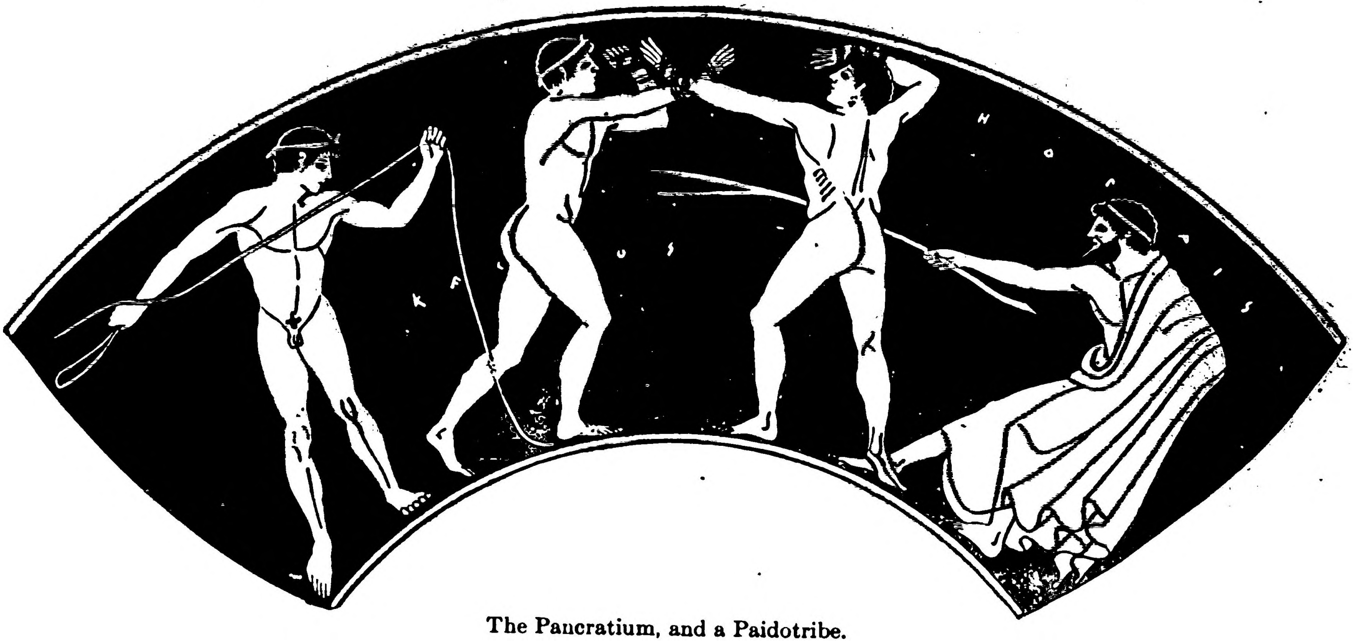
The value of all this is not simply the value of a poetic philosopher's dream. It is rather the interpretation of the essential spirit of Greek education by the greatest of all Greek thinkers. It was practically adopted in its main features by Aristotle (*q.v.*), fragmentary as is the treatment of education by Aristotle that remains to us in the *Ethics* and the *Politics*. Aristotle, like Plato, urges that education should be compulsory and controlled by the State. He does indeed insist on defining the Form of Good as the highest good for man, Happiness, and happiness as the perfect exercise of the rational activity which is man's unique characteristic, so that education becomes in its highest aspect a training for leisure, for the contemplative life. And he gives a new clearness to two points that seemed to him to need special emphasis, — the significance of habit and the doctrine of the Mean. But Aristotle's value here as elsewhere is rather in a certain formulation and clarifying of the issues, a practical insistence on accurate definitions, than in any real modification of his master's teaching. In his statement of the aim and method of education, of the curriculum, of the ethical purpose of education and its relation to the state, Aristotle leaves Plato's doctrine untouched. So that we may safely say that the system outlined in the *Republic* remains for us the final statement of the theory of Greek education, the one perfect interpretation of its letter and its spirit. C. F. L.

Educational Practice. — The first thing to be noticed about the Greek infant was that its father had powers over it wholly denied to modern parents. The first question after its birth was this, Would the father rear it or expose it? Greek literature has so many allusions to the exposing of infants, that it must actually have occurred in Greek experience. But the frequency of this *motif* in the New Comedy is hardly good evidence that such barbarity was of everyday occurrence. The fact that there is no evidence of a distinguished person in all Greek history, who had been picked up and reared as an exposed or deserted child, may be taken as proof that in the case of male infants exposure was very rare, unless the child showed congenital deformity. Regarding females, the case is different. Indeed, the great majority of the instances met in the comedies of exposed children, afterwards recognized, are those of girls. Plato sanctions infanticide under certain circumstances, and this is even worse than the exposing in some place where the child would probably be picked up as a slave. It is not unlikely that one of the causes of the dwindling away of the Greek population by a strange atrophy in the third century B.C. is partly due to the exposure of female children by selfish and barbarous parents. In the many suits of the Attic orators about family affairs there does not seem to be a case in which a large family of children is concerned.

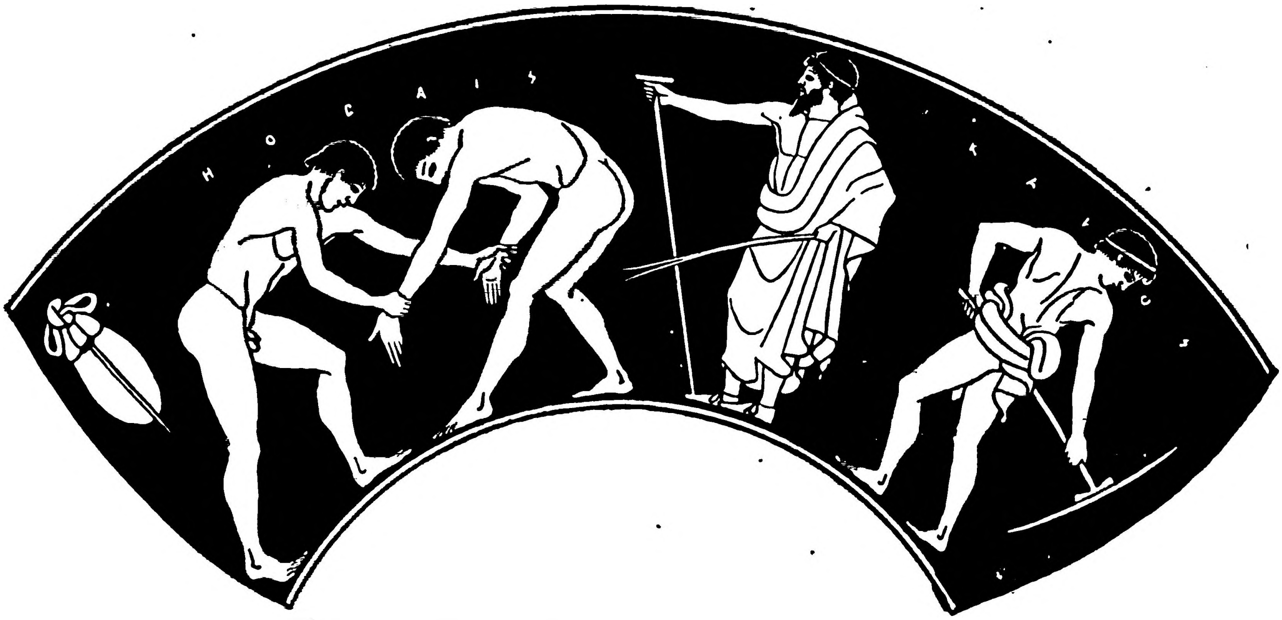
When the child was once accepted by the father, there is every reason to believe that it was treated with every kindness, nay even with luxury and indulgence. The well-known passages in Homer about Hector's child Astyanax, both during his prosperity and when left to a widowed mother, and other casual references, not only in Homer, but in Herodotus and in the lyric poetry, show clearly enough that babies were as much prized and as much attended to as in modern life.

The string of infantile diseases, which are the bane of modern life, are not heard of. Not even in Hippocrates' admirable clinical observations do we have croup or teething or measles or whooping cough. Malaria there probably was, and there is even evidence that it contributed not a little to the further decay of the population, where marshy lands ceased to be continuously cultivated. Fashionable people kept nurses, and it was a matter of high fashion among Athenian and other aristocrats to have a Spartan woman for the purpose, as she was supposed to know better than others how to make the child healthy and strong in limb. But only some misfortune, such as a successful raid, could reduce a genuine Spartan to such a condition. Probably women from the Lacedæmonian coast, although Helot women, were so called when they were fortunately obtained. What the usual diet of infants was we are not told except in Homer, who says Astyanax was fed upon marrow and mutton suet. This seems part of the general meat diet in which the heroes indulged, and which was certainly widely different from historic Greek diet. In the latter very little meat was eaten by anybody, and only on special occasions, such as feasts to the Gods. Contrary to the modern practice of hiring foreign nurses or governesses to teach the child some European tongue other than his own, when he can acquire it without the trouble of grammar, — this side of education did not exist among the Greeks, who despised all tongues but their own. For any child to be brought up speaking even Egyptian or Macedonian would have been thought a blemish rather than an accomplishment. But beyond this negative certainty, the women's apartments, in which the children, both boys and girls, were kept for the first few years, are closed so completely to us that but few things about the life of Greek babies can even be conjectured. A few late epigrams tell of the grief of parents bereaved of their infants. The backwardness in culture of Greek women leads us to suspect that babies were more often badly brought up and overindulged than at present, even though the " Spartan mother " is still proverbial and shows that a lofty ideal was not unknown to them. But in the rest of Greece it may be assumed that the young child arrived at his schoolboy age more willful and headstrong than most of our watched and worried infants. Archytas, the philosopher, earned special credit for inventing the rattle, and so saving much damage to household furniture by occupying children with this toy.

It must be remembered that the external circumstances of a Greek boy's life were somewhat different from the present. Except in some few places, such as Elis, and partially at Sparta, which consisted of five villages, all old Greek life of the better classes was town life, so naturally Greek schools were day schools from which the children returned after lessons to the care of their parents. To hand over boys, far less girls, for pay to the charge of a boarding school was unknown, and any such proposal would doubtless have been severely censured. Orphans were placed under the care of their nearest male relative, even when their education was provided by the State. Again, as regards the age of beginning school, it will naturally be earlier than is usual among us, for day schools can receive very young children, and in but few households were either father or mother able or inclined to undertake the training of their children in school work. Even the knowledge of letters and reading were obtained from the schoolmaster. But the small number of subjects taught prevented any hurry such as that in modern times, when there is no adequate time for languages, sciences, histories, and all the rest which is crammed into our unfortunate children. Above all, there were no competitive examinations save in athletics and music. The Greeks never thought of promoting a man for dead knowledge, but for his living grasp of science or life. Owing to these causes, the theorists discussed the expediency of waiting till the age of seven before beginning serious education. Some there were who recommended easy and sportive lessons from even an earlier age. On this point, therefore, they agreed fairly well with modern views. But Greek parents were, like those of the present, often over-anxious or nervous or dilatory, and it is clear that there were intervals between infancy and school life which were spent in playing in the street and doing mischief. Even so aristocratic a boy as Alcibiades is reported by Plutarch to have shown his pluck and obstinacy by lying down in the highway, when a coming cart threatened to disturb his game, and daring the carter to drive over him. There is, also, extant a long list of names for the games of boys preserved in glossaries. It belongs to the question of education to know something of the natûre of these games, wholly different from the exercises and competitions afterwards carried out in the palæstra. Among young boys, as among the lower animals, most games in concert are imitations either of war or the chase; the rest are the practice of some bodily dexterity, such as hopping, or throwing, or whipping a top or shooting with marbles. All these were common in Greece. They had the hobby horse, also the hopping on a skin bottle filled and greased, and blindman's buff, etc. There was a game like our peg-top spinning and contests of two sides or teams of boys. There is no need to enumerate all these particularly. More peculiar were the game of throw-



The Pancratium, and a Paidotribe.



Wrestlers, Paidotribe, and boy preparing the Ground for Jumping.

A GREEK GYMNASTIC SCHOOL.
From a Kulix.

ing up five pebbles or knucklebones, and receiving them on the back of the hand so as to lie there. Another game consisted of flying a beetle with a long thread, and fastening to him a lighted wax splinter (or match). This barbarous amusement is said to have been still in use recently in modern Greece. Spinning tops, rolling hoops, and playing with balls were all common. This latter was done even by grown girls, according to Homer's *Odyssey*. Some of them approach both to our football, handball, and even lacrosse. The use of knucklebones or *astragali*, smoothed and squared so as to serve for dice, afforded scope for the children's gambling propensities, and throwing with them for luck is often represented in Greek art. We also have in the extant specimens some which were clearly loaded. Another common game was the Italian *morra*, the prompt guessing of the number of fingers thrown up by the adversary which can be seen every day in southern Europe. Very likely the game of *bocchi*, which corresponds to our bowls, and is so universal in Italy, has an old Greek origin. Walking on stilts, leap-frog, swinging, and tossing in a blanket will suffice for any further enumeration, which serves only to show how remarkably modern were Greek, or perhaps how remarkably primitive is our catalogue of little boys' games.

Nothing is known about the condition of little girls, except that they certainly engaged in ball playing. As among us, so of course in Greece, girls joined in the games of their brothers, so far as they could be carried on indoors, or in the closed court of the house. There are graceful representations of them practicing swinging and seesaw. Dolls they had in plenty, and dollmaking (of clay) was quite an extended trade at Athens. In more than one instance there have been found in children's graves their favorite dolls laid beside them as eternal keepsakes. Most unfortunately there is hardly a word left of the nursery rhymes, and but little of the folklore, which are of considerable influence in the education of our children. The fables attributed to Æsop show how popular such literature was from an early epoch.

When we come to school life the most striking difference between the Greek education and ours is this, that even with little boys, physical development was attended to by a special master in a special place, except in those rare cases where they practiced out-of-door sports, and these cannot be commenced at the age of seven, or even near it. The Greeks indeed afforded their boys two contrasted sides of exercises — hunting, which was practiced by the Spartans, and also no doubt by the Eleans and Arcadians, as we may infer from Xenophon's *Tract on Hunting*, and gymnastics, which in the case of boys was carried on in the so-called *palæstra*, a sort of open-air gymnasium (in our sense) kept by a private individual as a speculation, to which the boys were sent, as to a schoolmaster. The Spartans had ample scope for hunting in the glens and coverts of Mt. Taygetus, and hence they despised mere exercises of dexterity in the palæstra, just as modern sportsmen think very little of spending days in a gymnasium. As to open air games, like hockey, football, etc., they seem not at all so well provided, and though they could have practiced rowing to their hearts' content, free men seem only to have done it as a duty in naval war; at other times slaves and hirelings worked their ships. Herodotus speaks of the generality of sailors (and that included a large section of the citizens in war) as able to swim, but Greek literature is silent regarding any competitions in this accomplishment. But in another point the Greeks agreed with the modern English; they regarded sport as a really serious thing, and unless it is so regarded, it will never be brought to any rational perfection. But then the Greek did not, like all people imbued with Semitic religious ideas, regard religion with such great solemnity. Their religion was not more serious than their sports; nay they were often combined; "for the gods too love sport," says Plato in his *Cratylus*, a very significant and thoroughly Greek sentence. The greatest feasts of the gods, and the funerals of the greatest men, were glorified by intensifying human pleasures, by games, and theatrical and dancing exhibitions.

There is no evidence whether the boys went to their palæstra at the same age as to school, and at a different hour of the day, or at a different age, taking their physical and mental education separately. Nor is it known which came first. The Germans think the palæstra came first, but it seems far more natural that letters should be taught from the age of seven, and exercises of the body later on. Even the theoretical schemes of Plato and of Aristotle do not help us here; it is one of the many points which every one omits to mention because it was familiar to all. We shall here take the physical side first, for the mental side is prolonged into higher education. And here, too, dividing the exercises of the palæstra into wrestling and dancing, more properly exercises of strength and exercises of grace, athletics will be treated first.

In order to go safely from home and return again, Greek boys going to the palæstra were put under the charge of a pedagogue (boy-leader), not to be mistaken for a schoolmaster, though the authorized version of the Bible has done it, when it makes St. Paul say: "The Law was our Schoolmaster to bring us unto Christ." The Greek pedagogue was merely an old and trusty slave, who was often fit for no manual labor. He was always ignorant, and never respected. He was in one sense, too, a chaperon, guarding his charges from making acquaintances or cultivating intimacies with other youths. The keeper of the school and trainer of the boys, though no state official, was under very strict regulations at least if the quotations from such laws in Æschines' speech *Against Timarchus* are to be believed. But if there were such penal laws, there is reason to believe that except in the case of some grave scandal they remained a dead letter. Still at Sparta, even in the gymnasia for grown youths, the regulation *Strip or go* was enforced to prevent a crowd of idle loungers from collecting. There are many pictures on vases of the interior of a palæstra. A rude bust of the bearded Hermes, the patron god, indicates it with certainty. A middle-aged man with a wand in his hand is directing the exercises, often wrestling, of the boys. We know from the *pentathlon* at Olympia for men, and even for a while for boys, that its five exercises — running, leaping, throwing the dart, throwing the discus, and wrestling — were the usual program. For older youths, boxing and the *pancratium* were added, save in Sparta, where such violent contests were thought to lead to disfigurements, and at all events to private feuds. The higher exercises were undertaken after rubbing the skin with olive oil, which became quite a heavy expense to some Greek cities, and was sometimes provided by private benefactions. When the exercise was over, the oil and dirt were scraped off with a *strigil*, as may be seen in the splendid statue in the Vatican of an athlete so cleaning his arm. The luxury of a bath is not mentioned, for in most Greek towns water was very scarce, and the nation was not given to much washing. The few details which remain about training, in the stricter sense, show that the Greeks were not scientific in their notions. Either cheese or in later days quantities of meat were specially recommended and the athletes were in consequence heavy and stupid people.

We have already quoted the passage from Plato's *Protagoras* in which the ordinary education of the Athenian is described. There is another passage in Aristophanes' *Clouds* (961 *et seq.*) which describes the older strict discipline of Attic boys, who were not allowed to whisper before their elders, who went in troops to school even in the winter mornings in deep snow, clad in a single tunic, and were kept at work by the master learning old traditional hymns — all this in contrast to the inroads of luxury and laziness, of vulgar and florid music, which that strict conservative reviles just as our old-fashioned people are shocked with modern education for girls. Both passages speak the voice of a cultivated society, and of high moral principle, which makes them worthy of the best modern and even Christian education. But the far wider connotation of the word "musical" is at once noted, which included a knowledge of good poetry, and also of the elegant and rhythmical dancing which was part of the solemn service of the gods. It included, in fact, every graceful, æsthetical, and intellectual accomplishment.

From these and many other passages it appears that the Greeks administered their early moral education just as the Protestants of England and America, through a book regarded as inspired; just as the stories of the Old Testament, as well as the teachings of the New, were taken as the highest moral teaching (not without wonderful liberties of interpretation, though the text was sacrosanct), so the Greeks treated Homer as their Bible, containing all the morals a child should know. Regarding the punishments which they inflicted, the notions then and now, or at least fifty years ago, are about the same. All the Greeks acknowledge the justice and expediency of corporal punishment, and only caution parents against applying servile punishments to free boys. A fresco from Pompeii shows a boy hoisted on the shoulders of another, being flogged by the master. At no time was the teacher of young boys for pay ever highly esteemed. There was, as already mentioned, no qualification demanded by the State. It must often have been the recourse of penniless or broken down men, just as in modern times penniless girls of the better class used to turn governesses. Hence the sneer of a comic poet: "The man is either dead, or teaching the alphabet."

The school was generally called *didascaleion* (teaching place) to distinguish it from the palæstra. Every Greek town had one or more, some of them large, for Herodotus tells of one at Chios, where the roof fell in, and killed 119 out of the 120 children attending it. In villages there were poor appointments, and such a school in Greece corresponded to the Irish hedge school or the cloister school of old monasteries. Statues of tutelary gods and some simple ornaments were found in the better ones. The master occupied a high seat, above his classes; the main difference from our arrangement was the absence of tables or desks, it being the universal custom when reading or writing to hold the book or roll on the knee. On the walls hang various things, all of which are not now understood, but among them were implements for reading and writing, boxes for book rolls, reckoning boards with pebbles strung in them, flute cases, and lyres. Lucian, a very late authority, says there were even notice boards, which were white, covered with chalk. Hence writing with the finger would be quite legible, especially if the original ground was black. There are also traces of pictorial illustrations of scenes from the *Iliad*, preserved at the Capitoline Museum in Rome, which seem to have been hung up in schools, like the zoological and other sheets in modern schools. Though later theorists speak of the necessity of pauses and variations in study, periods of holidays for all, such as the dog days were at Rome, are not referred to. As every child was taught to read and to recite from the great poets, a double object was attained. The schoolboy was taught to speak accurately and read rhythmically; he was also made acquainted with the choicest passages in older literature. Written books not being as common as they are now, much more was done by dictation and conversation.

When children came to writing, they used tablets covered with wax, on which the pointed stylus drew a sharp line, which could be smoothed out again with the flat reverse end. In writing on papyrus a reed and ink were used, and there are extant many boys' exercises on papyrus from Greek tombs in Egypt. The knowledge and study of grammar only came in with the Stoics and was the task of grown men, rather than of boys. There are many specimens of this sort of analysis in the Platonic literature, and indeed some very primitive ones in Aristophanes' *Clouds*. Geometry and arithmetic (the science of number) were also advanced studies, but the art of reckoning was learned like our practical use of figures. It is known that the system of notation learned was not the cumbrous one found in inscriptions but the very compendious and practical one used in countless Greek papyri found in Egypt. The alphabet enlarged by three signs for 6, 90, and 900 supplied the whole system. With *ι* began the tens, with *κ* the twenties, with *ρ* the hundreds, with X the thousands. M was 10,000. Thus 10049 was Mμθ. There was no symbol for 0, but the place in the alphabet told at once what is now expressed by cipher following a number. Fractions were expressed by the same letters with an accent over them. Only the denominators were written, the only numerator being 1; $\frac{2}{3}$ had a special sign; in other cases a fraction was broken up, *i.e.* $\frac{11}{12}$ was expressed as $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{6}$. Further details would be out of place here, but in these symbols are found very elaborate computations rising to very large figures.

Turning to what are now called accomplishments, but which the Greeks called music, there are a good many late and not very trustworthy authorities stating that drawing (not of landscape but of figures and of household objects) was generally taught. This seems very doubtful, but no one can deny that music (in our sense) was never omitted. The Greeks put the greatest stress on the directly moral and immoral effects of music, according to the scale or mode used. There were strict and sober kinds; there were effeminating and even lewd sorts; the proper educator should not allow the latter to be heard by boys. Our difficulty in appreciating this side of Greek education is that, though we know and can appreciate their simpler scales or modes and their notations, the fragments preserved of their tunes are so unlike anything now known and understood as music, that no modern composer, however learned, could supply a missing bar in the Hymn found at Delphi with even the smallest proof that his restoration was correct. In society there were great gentlemen, like Cimon, who sang and accompanied themselves on the lyre. But in general, playing and singing in society was left to the not very reputable professional. Choral singing and dancing with accompaniment of lyre or flute was a splendid feature in Greek feasts and in the theater. These solemn dances and the singing were performed by lads whose voices must have been formed again after breaking, — a thing not noticed in the usual accounts which make them boys of fourteen to eighteen, when modern boys lose their voices. Of the instruments in use, the syrinx or Pandean pipes were only used by shepherds, and not in schools. The trigônon or triangular harp, and the double flutes were only used by professionals. The lyre was made by stretching gut strings across the concave side of a tortoise shell, which is often found clean and dry in Greek watercourses. There were much more elaborate kinds which added a neck and made an instrument something like the modern guitar. The former had seven or ten strings. Their flutes (though they knew what we use) were rather clarionets held straight, and with a wide mouth.

The last stage of a boy's education was the so-called ephebic training, which was intended to prepare boys directly for the service of the state as soldiers, and in that respect is like the compulsory soldiering in nations that have a conscription for their defense. No boy was allowed to pass from his school days into citizen life without some training in the use of arms beyond that of the palæstra, and in military discipline. These ephebi had two duties to perform, the most important was patrol duty on the frontier of their state, where they did the work of military police, and probably also of preventing any considerable smuggling across the frontier so as to defraud the duty raised in the recognized markets where citizens from both states exposed their wares. They also stopped the depredations of footpads or highwaymen, so that brigandage was quite rare in the more civilized parts of Greece, till the days of its depopulation and decay. These youths were dressed in the short dark gray cloak and the soft hat seen in the Parthenon frieze, which also depicts the second great duty of the ephebi, that of adorning the feasts of the gods in solemn procession. All the varieties of their duty appear in this famous composition. They are carrying sacred vessels, leading victims, managing prancing steeds, with exquisite grace and in wonderful variety. It is remarkable that in spite of this clear exhibition of the class, it had not yet attained any state recognition, so far as can be inferred from Herodotus and Thucydides (fifth century B.C.). In later days, numerous inscriptions show that the ephebi, with clubs and meetings, with their resolutions and decrees, were at least as important as the societies of students in our modern universities. Stobæus has preserved a text of the oath by which these youths were bound. It has been criticised and questioned by the skeptics, but even if somewhat modernized, perhaps in Roman days, it represents quite truly the spirit of the whole institution. "I will never disgrace these hallowed weapons, or abandon my comrade, beside whomsoever I am placed (in battle) but will fight for both sacred and secular things with my fellows. I will not leave my country less, but greater and better by sea and land. I will obey the rulers appointed and the established laws, and whatsoever new laws the state may lawfully establish; and if any one attempt to abolish the existing ordinances or disobey them, I will resist him, and defend them individually and with the rest. Be my witnesses Aglauros, Enyalios, Ares, Zeus, Thallo, Auxo, Hegemone." This list of gods can hardly be a late invention. It is not within the scope of this article to describe the exaggerated importance of this ephebic institution in Greece under the Roman Empire, when fashionable strangers crowded to Athens as their place of intellectual amusement as rich Americans now go to Oxford. It was then a genuine part of Greek education, much as it has been described by Aristophanes and Xenophon.

In higher education it is impossible to ignore the famous teaching of the sophists, who were not recognized or even approved by Greek politics, but who set up as adventurers, or itinerant teachers to train the richer and idle young men how to think and speak upon the subjects of the day. They desired to give by discussions and lectures not only a training in rhetoric, logic, and political sciences, but the gamut of information now offered by the leading articles of our daily press which profess to tell their readers what to think about the current topics of interest. Cultivated people can hardly appreciate how these superficial articles affect the thought of the lower middle and the lower classes in modern life. The sophists may have had this great influence on a small society, which had no books on daily topics and was more easily led by a persuasive teacher. Just as our newspapers contribute a great deal to general culture, so did the sophists. Just as they have grave faults, so had the sophists. But grave and perhaps just as are the charges of superficiality, irreverence, and destructive criticism made against them there must have been among them wise men and good teachers. Among the innumerable passages in Plato relating to the sophists we may note one in the *Protagoras* that is instructive and free from hostility. When Socrates asks Protagoras what he undertakes to teach he answers: "'If Hippocrates comes to me he will not experience the sort of drudgery with which other sophists are in the habit of insulting their pupils; who, when they have just escaped from the arts, are taken and driven back into them by their teachers, and made to learn calculations and astronomy and geometry and music (he gave a look at Hippias as he said this); no, if he comes to me, he will learn that which he comes to learn. And this is prudence in affairs private as well as public; he will learn to order his house in the best manner, and he will be able to speak and act for the best in the affairs of the State.' 'Do I understand you,' I said; 'and is your meaning that you teach the art of politics, and that you promise to make good citizens?' 'That, Socrates, is exactly the profession which I make.'" But perhaps it was rhetoric, the art of persuasion and debate, that drew the youth of Athens to the sophists, rather than anything deserving the name of political science. Indeed, we may date from the age of the sophists the rise of rhetoric to the place that it was to hold in education through the entire period of Roman domination. (See ISOCRATES.)

If nothing has been said about the education of girls, it is only because nothing is known about it. Xenophon represents a bride coming into her husband's house, having lived her youth in darkness and in fear, knowing nothing but how to adorn her person and that artificially, with powder and rouge, and with enhancements of dress. The Spartan women brought up in great liberty, and freed from the strict discipline of the men, are spoken of now as specimens of bravery and patriotism, now as turbulent and mischievous to the peace and order of the state. But except that they trained openly like boys, we know nothing of their education.

The age of the Sophists, Socrates, Plato, and Aristotle, *i.e.* the later fifth century and the fourth, was the age of the breaking up of the older traditions and institutions, the collapse of the city state before the power of Macedon, and the scattering of the Hellenic culture through the eastern world by the conquests of Alexander. As was inevitable the old forms and standards of education, as of moral, intellectual, and political life gave place to a new cosmopolitanism and individualism. The dissolving and reconstructive effect of the new spirit was seen perhaps not so much in primary as in advanced education. Philosophy and rhetoric became immensely popular, and schools arose in Athens and Alexandria to which the previous century offers no parallel, such as the rhetorical school of Isocrates (393–338 B.C.) and the philosophical schools of Plato (the Academy), Aristotle (the Lyceum), and Zeno (the Stoa or Porch). In Athens the old custom of Ephebic education supervised by the State was joined to the three philosophical schools, teachers of rhetoric and logic were added, and thus was formed the University of Athens (*q.v.*). Athens had however one rival, especially during the earlier centuries of the Christian era, viz. Alexandria (*q.v.*), where another university grew up about the great library. But long before the suppression of the University of Athens by Justinian in 520 A.D. and the close of the intellectual greatness of Alexandria with the Saracen conquest (640 A.D.) Greek education had begun to lose its distinctive characteristics under the influence of Roman rule and the rise of Christianity. J. P. M.

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GREECE, EDUCATION IN MODERN. —

Historical. — The history of education in Greece may be conveniently divided into four periods. The first of these extends from the sixth century B.C. to the third century of the Christian era, when Constantinople became the center of the Roman world. Although during this time the independence and unity of Greek national life was destroyed by the Macedonian conquest (338 B.C.) and finally by absorption in the Roman empire, Greek culture retained its distinctive character and was imparted to the conquering peoples. The second period coincides with that of Byzantine supremacy and ends with the fall of Constantinople in 1453. The third period is that of Turkish domination from 1453 to the War of Independence (1821), which ushered in the fourth or modern era. Of the earlier periods it is sufficient here to note that the first was that of classic Hellenism of which Athens was the proud center. The second period was marked by the fusion of Hellenic philosophy with Christian doctrine, and although during this time the ancient schools of Athens and of other Grecian cities declined, or were abolished by imperial decree, the Greek language and traditions survived in the brilliant capital of the East; for, while Latin was the official language of the Byzantine court, Greek was the language of the people, and Christian Hellenism the culture which drew scholars from the West to the University of Constantinople. (See ALEXANDRIA, SCHOOL AND UNIVERSITY OF; ATHENS, UNIVERSITY OF.)

The Turks, though not always openly hostile to Byzantine education and culture, looked upon it with indifference and contempt. They did not, however, interfere directly with the education of such Christian inhabitants of the Empire as could pay liberally for the privilege. Yet the Christians were not free men; no career, under ordinary circumstances, was open to Greek scholars save that which the Church afforded; the common people weie plunged in abject poverty; and the more fortunate hesitated to educate their children for fear of increasing their attractiveness. Girls were in danger of being appropriated for some harem, and every four years a certain number of small Christian boys were taken from their parents to be trained as janizaries. The very existence of this child tribute, and the tax of one tenth of the male children for employment in various offices, threw such gloom over family life that education could not well flourish, even if there were no other causes to prevent it.

Under these conditions the Greek church became the bond of union between all the Greeks in the Turkish empire, whether they lived in the Grecian peninsula, in the adjacent islands, or in Asia Minor, and the symbol of their lost national life. Such schools as they had were under the supervision of the clergy and often under their direct control. The schools for the common people were similar in many respects to the Church schools of Western Europe, but they resembled also in some particulars the ancient schools of Arabia and India. Pupils were taught to read the church service and the elements of arithmetic and writing. There were no special school buildings, but the pupils assembled in the narthex of some church, when their teacher was an ecclesiastic, or in the shop of some handicraftsman when he happened to be the school-teacher. They had no chairs, but sat crosslegged on mats or rugs laid on the floor. Their books were in manuscript, since the art of printing was not yet at their service. Each pupil usually had but one book at a time, and his promotion to another book was joyfully celebrated by his family and relatives. The schools were generally held in the daytime, but in the communities, where the pupils were engaged in labor during the day, night schools were sometimes held. A reference to these occasional night schools is contained in an old song which is still widely known throughout Greek lands.

In addition to the elementary schools, the ecclesiastical authorities established a higher order of schools termed Hellenic, their main purpose being to preserve the knowledge of rhetoric and the ancient language. The pupils of the Hellenic schools were generally intended for the service of the Church, although a small proportion looked forward to the secular callings. These two classes of schools, the elementary or demotic and the Hellenic, formed the basis of the national system established after the war of independence.

Even during the seven years' war (1821–1828) plans for an organized system of education were discussed, and in 1823, the Assembly of Atros voted that a system should be established. Foreigners devoted to the cause of the Greeks, in particular Lord Byron and

Leicester Stanhope, encouraged the effort. When temporary peace was secured and a provisional government established under Kapodistrias, the movement for a national system of education became general, and in 1828, within the short space of three months, twenty-two primary schools were opened in towns on the Ægean islands. In these the Lancasterian method of mutual instruction was used. The expense of the schools was borne by the communities. In January, 1829, Kapodistrias appointed a committee on elementary education, entrusted with the duty of organizing and establishing a system of elementary schools. This committee gave the elementary (demotic) schools the character which they still retain. Thus the foundations of the present system were laid before 1830 in which year the kingdom was organized under the protection of the three powers, Great Britain, France, and Russia. From time to time laws have been passed which taken together provide in detail for a system of public education.

Present System. — *Administration.* — The Minister of Education (and of Ecclesiastical Affairs) is one of the seven members of the cabinet. His appointment is largely a matter of politics and his tenure of office is usually brief. He has authority to determine what subjects are to be taught in all the schools, both public and private, and he fixes the time that must be devoted to each of these subjects in the course of study. In regard to the elementary and Hellenic schools he determines the minimum equipment for schools of each class and he appoints the committee that approves the textbooks submitted in the annual competition. The Minister appoints all teachers and has authority to move or remove teachers in the Hellenic schools and in the gymnasia. This power in the hands of a frequently changing ministry leads to insecure tenure, and it sometimes happens that teachers are changed from desirable to undesirable places for purely political reasons. He also appoints one chief inspector of elementary schools, four inspectors of intermediate schools, and one inspector of elementary schools for each of the twenty-six provinces.

At the head of each province is a Nomarch who is appointed by the King. As one of his duties consists in supervising the funds of the demes comprised in his province, it is not surprising that he is required to look after education. In practice, this official as well as the Demarch, confines his attention to the financial affairs of the schools and leaves the supervision of them and the examination of the pupils to a supervisory council which is composed of the bishop, the school inspector, the director of the gymnasium, or, if there be no gymnasium in the province, the director of the chief Hellenic school, and two other members, one of whom must be a professional man, and the other a business man. The inspector visits the schools and reports to the supervising council, of which he is the chairman and executive officer. He is also a member of the General Council of Public Instruction. The Supervisory Council holds monthly meetings, transacts all business of the province connected with the administration of the schools, including the nomination of teachers, the discipline of pupils, the inspection of the equipment and instruction in the elementary schools of the province, and the examination of pupils.

The various demes (local districts) are required to establish elementary (demotic) schools, but a provision in the constitution makes it possible for the government to contribute to elementary education "in proportion to the necessities of the demes." Thus it happens that some of the schools in the poorer demes are entirely supported by the government, while other demes support their own schools. The total expense of conducting the elementary (demotic) schools for the school year 1907–1908 was 6,692,098 drachmas [$1,231,574.91]. (A drachma is equivalent to $0.193.) The national budget for this year contained an item of 1,000,000 drachmas [$193,000] for the purpose of assisting needy demes. More than 60 per cent of the elementary schools are supported wholly or in part by contributions from individuals or societies. Tuition in the elementary schools is gratuitous and the attendance for both boys and girls is compulsory from six to twelve.

Elementary Education. — The elementary schools have either four or six-year courses. If the school provides a four-year course it is called a common (*κοινόν*) elementary school. If, however, it provides a six-year course, it is a complete elementary school. Of the 3418 elementary schools reported in 1908, 1571 were common schools, and 1847 were complete schools. In theory coeducation of the sexes does not exist in Greece, but in the smaller towns and in the rural sections, where the school attendance is not over seventy-five, both sexes attend the same school and are taught by one teacher. This arrangement is not permitted after the children are ten years of age.

In principle, Greek education is clerical, compulsory, and gratuitous. Thus three hours a week are devoted to the study of religion, which consists of instruction in sacred history, catechism, and reading from the Holy Scriptures. Jews and Roman Catholics have special instruction from the clergy of their own churches.

The teachers of the elementary schools are of three grades, depending upon their experience and preparation. The grade of the teacher determines not alone the type of school in which he may teach, but also the salary he is entitled to receive. Teachers of the third or lowest grade are usually found in schools where the enrollment is from fifteen to forty. If the enrollment is more than fifty-five a first grade teacher is required. The minimum qualification for elementary teachers is a license from one of the teachers' training schools. The normal schools admit only men. Four of these schools have three-year courses, and one subnormal school a one-year course. A school for training teachers of gymnastics was established in Athens in 1899.

TABLE I. — THE SUBJECTS TAUGHT IN EACH GRADE OF THE SCHOOLS AND THE HOURS PER WEEK DEVOTED TO INSTRUCTION IN EACH SUBJECT.

SUBJECT	ELEMENTARY				INTERMEDIATE						
	Common[1]				Hellenic			Gymnasium			
	1st yr.	2d yr.	3d yr.	4th yr.	1st yr.	2d yr.	3d yr.	1st yr.	2d yr.	3d yr.	4th yr.
Religion . . .	3	3	3	3	2	2	2	2	2	2	—
Greek, ancient	13	11	10	10	6	8	8	10	10	10	10
Greek, modern					2	2	2				
Latin . . .							1	3	3	3	3
French . . .						2	2	3	3	3	3
History . . .			2	2	2	2	2	3	3	3	3
Geography . .		2	2	2	2	2	2	2			
Mathematics .	3	3	3	5	3	3	3	4	3	4	5
Natural history			2	2	2	2		2	2		
Physics . . .				2			2			3	3
Philosophy .									1	1	1
Drawing . .			2	2	2	1	1				
Penmanship .		2	2	2	1	1	1				
Vocal music .	3	3	3	3							
Gymnastics .	4	4	3	3	3	3	3	3	3	3	3

[1] The course of study for the complete elementary school includes the four years of the common school course and two years of the Hellenic school course.

The work of these schools is divided between theory and practice. Each of the normal schools has a practice school connected with it.

Men teachers of the first grade in the complete schools receive 1800 dr. per year; the second grade teachers receive 1440 dr.; and the third grade 1200 dr. per year. Women of the same grades receive 1440 dr., 1320 dr., and 1200 dr., respectively. The local communities may increase these amounts. The teachers in the common schools receive 660 dr., 780 dr., or 900 dr. per year, depending upon the grade which they teach. Each teacher contributes to a pension fund. Tenure of office for these teachers is permanent during good behavior.

Intermediate Education. — From the elementary schools boys may pass to the Hellenic schools. Those who come from the common schools enter the first year of the three-year course; but those who have taken the six-year course of the complete elementary school enter either the second or third year of the Hellenic school. A recent Minister of Education urged that the last year of the course in these schools should be added to the course of the gymnasia. This would abolish the Hellenic schools, for the first two years of their course is now given in the complete elementary schools. Of the 314 schools that were reported for 1907–1908, 267 had three classes, 15 had two second classes, while 32 had only a one-year course; 20,517 pupils were enrolled in these schools, and the total expense was 2,477,022 dr. There usually are at least as many teachers as there are classes in the Hellenic school. Teachers in the Hellenic schools must have a diploma from the University; and to obtain the higher positions they must have passed the examination for the master's degree or even the doctorate. The head teacher, or director, of a Hellenic school is called the scholarch, and receives from 2400 dr. to 3000 dr. per year. The salaries of subordinate teachers vary from 1200 dr. to 3000 dr. per year. These teachers are appointed by the Minister of Education and they have no fixed tenure.

Secondary Education. — After independence was achieved, secondary education showed plainly the influence of German models. The first gymnasium in Greece was the Central School, founded in Ægina on the 13th of November, 1829. The number gradually increased, and at present there is a gymnasium in every town of sufficient size to justify the expense. In the larger cities, Athens, Patras, etc., there are more than one, according to the population. Each gymnasium is managed by its own faculty. At the head of the faculty is the gymnasiarch, who is both a teacher and general director. He also serves as one of the members of the Supervising Council for the province. The program of studies is regulated by an official scheme which is modified to suit the individual schools (see Table I).

The gymnasia are generally supported by the State; but in places where the population is not large enough to justify this expenditure by the State, the people of the community sometimes support one for themselves, paying the expense in some ingenious way. For instance, the town of Nesion, in Messenia, not being favored by the government with a gymnasium, its inhabitants were in the year 1896 supporting one by a voluntary tax, levied and collected by themselves, of one centime on each oke of grapes or figs produced in their fields. Pupils are required to pay small entrance and certificate fees. The gymnasia are classical schools, but the physical sciences are included in their course of study. Until recently, however, the latter subjects have been little regarded, since the great importance of classic education in Greece overshadows the high claim that the physical sciences have on modern education. The schools lack apparatus; yet, improvement in this respect is taking place and professors are being secured who have won their diplomas in the physical sciences, and are, therefore, both capable teachers and interested in the progress of their specialty.

The younger Greeks are eager for education, and efforts are made to encourage this ambition. There is, however, a growing conviction that the education afforded by the schools is not sufficiently practical. Plans for modifying the system have been considered by two recent national assemblies, but as yet no agreement has been reached. The experiment of a "practical gymnasium" is being tried now in Athens. No new gymnasium of the regular type has been founded since 1900, but between 1901 and 1908 six commercial schools, with four-year courses were established. In 1908 these schools were employing 33 teachers, and had 315 students enrolled. The total annual expense of conducting them was 113,640 dr.

TABLE II. — STATISTICS OF THE PUBLIC SCHOOL SYSTEM FOR 1907–1908

	ELEMENTARY (deme)	HELLENIC	GYMNASIA	
			Public	Private
Schools	3,418[1]	314	26	11
Teachers . . .	4,336	931	183	97
Gymnastic teachers		9	26	6
Students				
Boys	170,374	20,517	3,941	1,352
Girls	71,059	—	—	—
Total expense				
Drachmas . .	6,690,098	2,477,022	767,376	259,090
Dollars . . .	$1,291,575	$ 478,065	$478,065	$50,161
Expense per pupil	$5.35	$23.30	$37.58	$37,92

[1] The 3418 elementary schools include 1571 common schools, 1224 complete schools for boys, and 623 complete schools for girls. The total also includes 2123 schools that are not supported by the State or demes.

Girls, Education of. — The education of girls in Greece, beyond the six years of the complete elementary course, is a matter of private enterprise, the oldest school for girls having been founded in 1831 by an American missionary, Dr. Hill, and his wife. Lately, however, the faculties of the national university have been opened to women. Among the schools for girls the most important is the Arsakion. This school was founded in July, 1836, by the Society of the Promoters of Education, and named after its chief benefactor, Apostolos Arsakes. There are now several branches located in different cities. The course of study begins with the kindergarten and ends with a three-year teacher's training course. Certificates from this school qualify their holders to teach in the elementary schools. More than 1800 girls are enrolled in the school, and more than 800 were taking the teacher's training course in 1908.

There are numerous societies which maintain private schools, noteworthy among these being the Parnassos Society, which conducts a night school for poor boys, of whom more than 2000 attend.

Higher Education. — The Greek educational system culminates in the National University at Athens. In April, 1837, Otto, who, after the death of Kapodistrias, had been appointed by the powers to be the first king of regenerated Greece, issued a decree for the establishment of a university. Following the custom of the Germans, he named the new institution after himself, and not until 1862 was the name changed to National University. According to the decree of 1837 there were to be four faculties: theology, law, medicine, and philosophy. The latter consisted of two distinct sections, philosophy and science. In 1904 each of these sections was made a separate faculty. The faculty of theology is composed of six professors and four assistants. In the law faculty there are nine professors and nineteen assistants. The medical faculty which is the largest, has eighteen professors and forty-eight assistants. The philosophical faculty has twelve professors and five assistants, and the physical and mathematical faculty has twelve professors and eight assistants. In 1842 a seminar in Greek philology was founded in the faculty of philosophy. The peculiar function of this seminar has been the training of teachers for secondary schools. Other seminars and various laboratories, museums, and clinics are supported by the university. Among the other more important subsidiary institutions may be mentioned the national observatory built in 1846, the botanical gardens and museum, the university library with more than 300,000 volumes, and the national museum.

Three months before the close of the school year the combined faculties choose one of their number whom the Minister of Education appoints as rector for the next school year. The rector is the executive head of the university and its representative at all functions. In like manner each faculty chooses one of its members who is made dean of that faculty for the following year by the Minister of Education. The dean presides at meetings of the faculty; he arranges the program of studies, and represents his faculty in the university senate.

The financial administration of the university rests with the university senate, a body composed of the rector of the university, the dean, and one other representative from each of the faculties, except the faculties of philosophy and physical and mathematical sciences. Each faculty proposes the candidates for the professorships, and the Minister of Education appoints. Prior to 1882 the professors were named by the king. The government pays the larger portion of the salaries of the university officers. For the school year 1907–1908 the receipts of the university were 546,185 dr. and the expenditures were 507,349 dr. In addition to this the government paid salaries of professors and various other expenses amounting to 584,960 dr. This amount included 85,920 dr. to aid needy students and those studying abroad.

Students pay 2 dr. a year for a certificate of attendance in each course they take. Tuition amounts to 160 dr. per year, and there is an examination fee of 250 dr. in the legal and medical faculties, but only 150 dr. in the other faculties. The diploma costs 50 dr. Students who have been graduated from the gymnasia, or institutions of like grade, are admitted without examination. The enrollment in the winter semester of 1909–1910 was about 2800 and in the summer session about 2500.

Other educational agencies which are not controlled by the government, but are sufficiently important to merit a mention in any description of the Greek educational system are the various archæological schools (see ARCHAEOLOGY). The oldest of these schools was established in 1846 and is called *École Française d'Athènes.* The American School of Classical Studies was founded in 1882 and is maintained by 26 American universities and colleges. The British School at Athens was founded in 1886. Other institutions are *Kaiserliches Deutsches Archäologisches Institut,* and *Italienisches Archäologisches Institut.* Greece maintains no archæological school, but two societies are active in archæological investigations. They are the Archæological Society, founded in 1837, and the Historical and Ethnological Society, founded in 1882.

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GREEK LETTER SOCIETIES. — See FRATERNITIES.

GREEK, STUDY OF. — In Universities and Schools of Europe. — Each successive migration of the Greeks may be said to have resulted in a twofold conquest, — a conquest by the invaders of the land and its inhabitants, and a more gradual conquest by the language which they spoke over the native tongue of the people whom they subdued. This widespread diffusion of the Greek tongue gradually, though slowly, resulted in a corresponding diffusion of Greek thought. And so there arose centers for Greek study in different parts of the Mediterranean countries, with Athens for a long time as the chief seat. The career of Athens, Alexandria, and Antioch as later centers of Greek learning is treated in outline in the articles on the universities and schools of those places. The condition of the study of Greek and the attitude of the Christian leaders toward Greek culture are also considered under the topics CHRISTIAN EDUCATION IN THE EARLY CHURCH, and CHURCH SCHOOLS; and the various articles on the Church Fathers (see AMBROSE, AUGUSTINE, BASIL, CHRYSOSTOM, etc.) treat of the attitude of the early Church to Greek culture and the Greek language. The fusion of Greek culture with Roman is treated in the discussion of ROMAN EDUCATION (*q.v.*), and the conditions during the Middle Ages are presented in outline in the articles on education in that period. A brief sketch of the condition of the knowledge of Greek from the late Roman period to the Renaissance is desirable as an introduction to the consideration of the place of Greek in modern education (see also RENAISSANCE, EDUCATION IN).

Under Constantine the Great Greek became the language, first of his court, and then of the official world. When, in 340, his eldest son and successor in the Western prefecture, Constantine II, fell in a campaign in Provence, a Greek monody, recited at Arles, was deemed the most appropriate tribute to his memory. At this time, indeed, the churches of Western Christendom were virtually Greek colonies, and both the Scriptures and the liturgies which they used were in the Greek language; so that, as late as the sixth century, we find Cæsarius, the eminent Bishop of Arles, granting permission for the use of such versions, as an alternative to Latin, throughout the churches of his diocese. A like permission was accorded to the churches in Marseilles; and the numerous Greek words which found their way into the French or Romance language of this period afford like evidence. The imperial designs, however, were far from commanding general assent, and in Africa Tertullian (*q.v.*) had long before declared that there could be nothing in common between the "Academy" and the Church; while he openly denounced philosophy as "the source of all the heresies" (*De Præscript.*, c. 7). Lactantius (*q.v.*), summoned by Diocletian to fill the chair of Latin at Nicomedia (then a famous center of Greek culture), found his position untenable; and at the court of Constantine at Gaul became conspicuous by the vehemence with which he inveighed against all Greek philosophy. His *Institutions,* which long held its ground in the Latin Church as the best authoritative exposition both of elementary Christian doctrine and the principles of Christian education, and the *De Nuptiis* of Martianus Capella (*q.v.*), embodying the classification of the liberal arts sanctioned by the authority of Augustine (*q.v.*), and reproduced long after in the universities of Europe, alike mark the trend of education in the West in comparative isolation from Greek and from Hellenic influences.

Throughout the fourth century, however, Alexandria maintained its reputation as "the last great nursery of Greek culture," and in conjunction with a new school of theology could point to a succession of eminent divines whose influence outshone, for a time, even that of Jerome and Augustine. Of this the mere citation of the name of Athanasius, Eusebius, Basil the Great, and Gregory Nazianzen (*qq.v.*) affords sufficient evidence; while John Chrysostom (*q.v.*), who was of Antioch, and subsequently Patriarch of Constantinople, has been designated "the model of a preacher for a great capital" (Milman, Vol. III, p. 118). He bequeathed to posterity a vast collection of sermons, letters, and treatises, of which the first-named have probably attracted in modern times a larger number of readers than the declamations of any other Greek orator, excepting only Demosthenes. In Byzantium itself the work of education went steadily on, and we have sufficient evidence that in the latter part of the eighth century there was ample provision for instruction in grammar, language, science, and philosophy (Bury, *Later Roman Empire*, Vol. II, p. 435); and the statement of Theophanes that Leo the Isaurian (680–741) put an end to "pious education" by shutting up the schools, refers probably only to a kind of theological seminary in the capital, which, under the management of its twelve teachers, became a nursery of superstition and was finally swept away in the commotion occasioned by the iconoclastic movement. It is certain that Europe was indebted to John of Damascus (nearly the last of the Fathers of the Eastern Church) for the introduction of the study of Aristotle into Christian education. Of the vast literature bequeathed by these Byzantine writers, although their pages contain many facts useful to the modern historian, comparatively few have been much studied in the universities. But the early years of the seventeenth century found Sir Henry Savile busiest with his fine edition of John Chrysostom, just as those of the sixteenth century saw Bentley engaged on the restoration of the text of Origen.

In the Western Empire, down to the time of the Renaissance, Greek learning appears only in occasional gleams, and no continuous tradition is discernible. It was undoubtedly the design of Charles the Great (see CHARLEMAGNE AND EDUCATION) and his adviser Alcuin (*q.v.*) that the language should be taught in the schools created by their joint efforts, but there is no evidence that their instructions were carried into effect; although when John Scotus Eriugena (*q.v.*), a fugitive from Ireland, succeeded to the mastership of the Palace School in the time of Charles the Bald, something must have been heard at Aachen about both Martianus Capella and Origen. Otto III, himself the son of a Greek mother, was able to raise his preceptor Gerbert (*q.v.*) to the papal chair, and the latter understood Greek, while his pupil emulated the ceremonial and usages of the Byzantine court. But the prevailing tendencies in Rome, both then and long afterwards, were unfavorable to learning in any shape; and in the thirteenth century a knowledge of Greek was even studiously disclaimed as likely to bring the possessor under the suspicion of heresy (Sandys, Vol. I, p. 583). Greek thought and Greek science, however, often found their way where the language itself was unknown; and authors who had written on philosophy, mathematics, astronomy, and medicine were widely read in Latin translations, the professors at the newly founded universities, Salerno, Bologna, Reggio, Modena, Vicenza, Padua, and Paris being wont to dictate and comment on these versions, long prior to the fourteenth century. The Saracens, again, during the reign of the Abbaside dynasty at Bagdad (750–1258), and that of the Ommiades at Cordova (756–1031), became acquainted, through translations made by Syrian Christians, with Aristotle, Hippocrates, Galen, Dioscorides, Euclid, Archimedes, and Ptolemy, and conceived an ardent admiration for most of these writers, at the time when the greatest part of Latin Christendom, absorbed in an exclusive devotion to the *Organum* of Aristotle and an unquestioning acceptance of the doctrine of predestination as proclaimed by Augustine, looked distrustfully alike on the theology and the science of the East. In the year 1311, however, the Council of Vienne having decreed that chairs of Greek, Hebrew, Chaldee, and Arabic should be founded in the universities of Paris, Oxford, Bologna, and Salamanca, Clement V did not deem it prudent to withhold his assent. But here again the scheme proved abortive and the papal signature was expunged; while in the fifteenth century the commentators on the Clementines even venture to deny that it had ever been attached (Mullinger, *Univ. of Camb.*, Vol. I, pp. 482–483).

Such were the conditions under which Petrarch (*q.v.*), when he first visited Rome in 1336, could find no one to teach him Greek, and even in 1360 could name only ten scholars in all Italy who possessed a competent knowledge of the language, — "three or four in Florence, one in Bologna, two in Verona, one in Sulmona, one in Mantua, but not one in Rome" (Voigt, Vol. II, p. 107). The humanist, however, could not long rest content with that Latin literature which itself continually revealed its own indebtedness to the inspiration derived from ancient Hellas; and as the aid of competent instructors in Greek literature became more and more indispensable, Manuel Chrysoloras (*q.v.*), the representative of the imperial court at Constantinople in Venice, was invited to Florence, where his school, probably the earliest for Greek after that of Lorenzo Pilatus (1360–1363), was open to all comers. He himself received a salary of 100 gulden, and lectured in Latin (1396–1400), taking Plato's *Republic* for his first subject. Chrysoloras subsequently lectured at Florence, Pavia, Venice, Bologna, and Rome; he died in 1415, when on a visit to the imperial court at Constance, whither he had repaired in order to take part in the proceedings of the great council. Under such auspices Greek now became fashionable in Italy; and it was rendered still more so by the genius of Guarino (*q.v.*), one of the disciples of Chrysoloras, who was able both to disarm the jealousy of Rome and to command the admiration of every scholar. In his classroom at Ferrara Englishmen were to be seen, some of them of distinguished rank; and when, in 1438–1439, the œcumenical council was convened in that city, his linguistic attainments were displayed in the skill with which he acted as interpreter between the deputies of the Greek and the Latin churches. (See also GUARINO, BATTISTA.)

The first great school for youth, however, was that of Vittorino da Feltre at Mantua, — the "Pleasant House," as it was termed. Although, after the fall of Constantinople (1453), the number of teachers in Italy was materially increased, they themselves brought but few manuscripts with them, and the paucity of the latter continued to be a serious hindrance to the study of Greek until the arrival of two Germans, Sweynheym and Pannartz, who had worked under Faust at Mainz, introduced the art of printing, while it at the same time ruined many of the copyists. A small Greek grammar compiled by Constantine Lascaris (*q.v.*), which appeared at Milan in 1476, was probably the first book printed in Greek.

Antiquarianism and the interest collaterally excited in the history of noble houses, especially that of the Medici, did much to attract the sympathy of their representatives to the study of the humanists, but in the earlier years of the sixteenth century a great reaction set in in Italy, and the interest of the progressive movement, as identified with Greek, next centers in Germany. At the time of Reuchlin's death (1522) Greek was taught in nearly all the German universities. But that eminent scholar had already been denounced by the seniors of the University of Basel for his temerity in there venturing to introduce the study of Aristotle in the original text; and in 1523 we find Budæus (*q.v.*) writing a Greek letter to Rabelais (who was, like himself, a member of the Franciscan order) to express his sympathy with his friend under the annoyance to which the latter had been subjected, in being debarred "by the Heads of your Brotherhood from the reading of Greek treatises." "We are aware," he goes on to say, "that those Greek-detesting theologians have been most zealous to abolish the Greek language, looking upon it as the test of their own ignorance; and it is on this account that we see the most worthless of them in their sermons in the churches, railing at it, and by every means bringing it into suspicion with the people, as a most execrable study and pernicious to true theology" (Smith, W. F., Vol. II, p. 489). Erasmus (*q.v.*) in like manner found himself confronted by the charge of favoring rebellion against the authority of St. Augustine. His knowledge of Greek had been acquired in Paris after his renunciation of the monastic life; it had been improved during his residence at Cambridge (1510–1514), and it was there that he made a translation of the first book of the grammar by Theodore Gaza (*q.v.*), which he printed at Louvain in 1516. In the same year he published at Basel the first printed text of the Greek New Testament, along with a Latin version by himself, instead of the Vulgate. His position, however, to the end of his career was that of an eclectic; for while denouncing Lutheranism as inimical to sound learning, he may be said to have educated Zwingli, whom he had taught Greek at Basel, and who, throughout his career as the head of the Reform party in Switzerland, always evinced a marked preference for the Greek patristic literature over the Latin. How well Erasmus educated himself may be seen in the critical comment which enabled him to recognize the superiority of the diction of St. Luke to that of the other Evangelists. Melanchthon's (*q.v.*) inaugural lecture in 1518, as professor of Greek at the newly founded university at Wittenberg, marks a further advance in relation to the study of the language, by the advice which he gave that it should be pursued *pari passu* with that of Latin, by all students "who sought to grasp the substance of the involved thought rather than its shadow." In the same year he published his *Greek Grammar*. The movement at Oxford, contemporary with the visit of Erasmus (1498–1499) resulted in no traditions. Grocyn (*q.v.*) is said to have lectured on Greek, and he possessed a fine library of classical authors, but his lack of critical judgment is evinced in his admiration of the current Aristotle, his disparagement of Plato, and his belief in the genuineness of the *Hierarchy* of Dionysius the Areopagite. At Cambridge, on the other hand, the foundation of the Regius professorship by Henry VIII in 1540 brought the study at once into favor, and the appointment of Sir John Cheke (*q.v.*) to the chair still further added to its popularity. Roger Ascham (*q.v.*), writing only two years later, describes the principal Greek authors as being already studied with an ardor altogether surpassing what had ever been elicited by the favorite Latin classics (Mullinger, Vol. II, pp. 52–57).

Philology, as a study, was as yet unrecognized; while all speculation on the subject was vitiated by the prevalent theory with respect to Hebrew, as the original tongue from which all the others were directly, or immediately, derived. In assigning the priority to a language in a scheme of instruction, the choice was accordingly supposed to lie between Hebrew and Greek. Rabelais inclined to put the latter first, as "that without which it is a disgrace for a man to style himself scholar"

(Smith, W. F., Vol. I, p. 246), — a view which appears to have been the current one in France long after his time. Ratke, in Germany, in propounding his scheme (1612), placed Hebrew first, then the Greek Testament, and thirdly Latin. His views, however, — put forth as they were in subservience to the prejudices of Lutheranism, which regarded the Greek and the Latin classics as alike demoralizing, — gained a temporary popularity greatly in excess of their real merits; and encouraged thereby, Ratke next proposed to substitute for the laborious imitation of the classical writers, which has been the practice of the humanists, a method similar to that whereby a colloquial knowledge of German or French is gained in the present day. The consequence was that both in northern Germany and in the Low Countries the critical faculty fell into disuse, and, in the language of Mark Pattison, "the Dutch editors shunned Greek, to which they were unequal, or only attempted it to give evidence that it was a lost science" (*Isaac Casaubon*, p. 458). Comenius, notwithstanding his enlightened views with respect to practical education, inclined to a like theory with regard to Latin, and connived at a laxity in Latin prose that threatened to result in the complete disappearance of a pure and correct style (Eckstein, p. 175).

The commencement of a radical reform dates from the time of F. A. Wolf (1759–1828), who, when a student at Göttingen devoted himself to the study of philology with a success that led to his receiving an invitation from Zedlitz at Halle, to transfer himself to that rising university, "in order," wrote the professor, "to free it from the reproach of being without a single student of the subject." Wolf's compliance resulted in a further extension of his researches to ancient history, and especially to everything that related to Greece, and the Greek language and literature, — his keen insight into the specific merits of the classic writers, both as regards style and matter, constituting an epoch in the annals of scholarship. With regard to the question of the order in which the two languages should be taken, he concluded that in all cases where the student gave evidence of an aptitude for linguistic studies, Greek should be taken before Latin, a view in which Gedike of Berlin and Herbart expressed their concurrence, urging (1801) that the Romans having been, as it were, the disciples of the Greek, it would be an inversion of the true order, alike of linguistic and of philosophic studies, to give the precedence to Latin. On the other hand, there were those who pointed out that, if Greek were taken before Latin, the requirements of the classroom would necessitate a considerable curtailment of the time allotted to the latter; and in connection with Greek, and largely under the influence of more independent research in other countries, two rival schools began, at this time, to divide the allegiance of the learned world. On Gottfried Hermann of Leipzig (1772–1848), it devolved to retrieve the disadvantages resulting from the influence of Ratke by pointing out that the study of Greek could be profitably pursued only by the adoption of a strictly logical and rational method; while August Boeckh (1785–1867), who, after studying theology and philosophy at Halle, had been professor at Heidelberg and in Berlin, concentrated his research upon the past history of institutions, art, and archæology. That Hermann was to some extent inspired by the example of Bentley (1662–1742) at Cambridge, is undeniable, but his editions of the tragic Greek poets and of Pindar bore the impress of an originality and critical insight unprecedented in Germany; while Boeckh's *Public Economy of Athens* and *Corpus Inscriptionum Græcarum* "laid the foundation for all later research in the departments with which they were concerned" (Sandys, Vol. III, ch. 29). In the freer atmosphere of the newly founded university of Berlin, the masterly investigations of Franz Bopp (*q.v.*) created, in like manner, the study of comparative philology; and his method, as set forth in his *Comparative Grammar*, afforded new guidance in connection both with Greek and with Latin.

In the meantime the question of priority had received a practical solution in France and in England by the requirement in Paris, as at Oxford and at Cambridge, that students on entering the university should already possess a colloquial command of Latin. In these important centers, accordingly, the language itself was not taught (it being presumed that the requisite knowledge had been already obtained at the grammar school), and Eton, Winchester, Westminster, Charterhouse, St. Paul's, and Christ's Hospital vied with each other in sending up youths who already spoke correct Latin and wrote Latin verse, and were thus able forthwith to devote their time to Greek and to Hebrew.

University Courses in Greek at Present. — It is impossible to give any statistical statement of the number of courses in Greek in the chief universities which would serve to indicate the strength of the subject in the different countries. It might be mentioned, for example, that in the German universities 142 courses were given in the summer semester of 1911, and that these were distributed among the following branches: philosophy (7); literature (66); composition (7); history (11); beginners (11); archæology and antiquities (23); philology and epigraphy (17). But the number of students who attended the courses is not available, nor can figures indicate the quality of the work done, for the productions in any field may be more valuable when confined to a small and selected number than when largely cultivated. In France, too, there are in the sixteen faculties of letters twenty-seven professors and two adjunct professors, assisted by twelve lecturers, but the scope of their work is as a rule not defined. Of the English universities Oxford and Cambridge are still the strongest centers for the study of the classics. Greek is studied intensively by all students who graduate in the school of *Literæ Humaniores* at Oxford and in the classical Tripos at Cambridge, and is also taken in certain groups for the pass degrees. Here, too, it is difficult to differentiate between those who give courses in Latin and those in Greek, nor would a statement of their work be significant, for much of the work is done privately with the college tutors. In the newer universities there are separate chairs for Latin and for Greek, while in some the lecturers or assistants may instruct in both subjects.

In American Universities. — Before the founding of the Johns Hopkins University (1876), there was nothing in the United States fully corresponding to the German philosophical faculty in the modern sense. But some advanced work was offered to graduates at Yale College from 1847, and soon after at Harvard, in classics, as in other subjects. The degree of Ph.D. for work primarily in Greek was first given at Yale, in 1863. At Johns Hopkins, Professor Gildersleeve began at once to draw able and ambitious students who previously would have gone to Germany. Gradually the strongest of the older colleges and state universities developed and strengthened their advanced courses in Greek; the University of Chicago from its first session (1892) made this one of its important departments. At present, besides the institutions already named, one might mention Columbia, Princeton, and the Universities of California and Michigan, with a few others, as furnishing good opportunities in their graduate schools for the advanced study of the Greek language and literature, as well as of Greek archæology. At none of these is the number of students in Greek large. It should be remembered also that the American School of Classical Studies at Athens is in effect a part of the graduate school of all American universities and colleges that unite in its support, and constitutes an important part of the provision made for Greek as a university study. To that school, as to the graduate school of several of the universities, women are admitted, as well as men.

In American Colleges. — In America as elsewhere the line between secondary school and college, as between college (or what corresponded to it) and university, has been an unstable one. To no subject does this apply more fully than to Greek. Still it may be said that from the foundation of Harvard (1636) Greek has always been regarded as a subject to be taught in college — required of all, in accordance with tradition, so long as any large part of the curriculum was required, but everywhere the first of the triad, Latin, Greek, Mathematics, to be made optional. In the state universities, as these were gradually established from 1837 on, Greek was one of the subjects to be taught in the department, however named, that corresponded to the older colleges. In most of these Greek was never required; in some, as at the University of California still, it was required for the degree of A.B. only, while another degree, usually intended to be of equal value, though lacking the prestige of tradition attached to the older degree, was always provided as the crown of a parallel course for which Greek was not required. Similar parallel courses, without Greek, have in one form or another been established at all important older colleges, except where Greek has ceased to be required for the A.B. degree. But it should be remembered that in the United States no profession or public office has ever been wholly closed, even by custom, still less by law, to those who knew no Greek. The restrictions long maintained in France and Germany in this regard never had a place here. This fact is usually ignored by people who would draw parallels between America and continental Europe. Further, each college being a law unto itself, there has been endless experimenting on this, as on most, educational questions; general statements must, therefore, be very broad, and detailed statements for the entire country would require too much space. But one may say that up to about the last quarter of the last century the degree of A.B. from all but the weakest colleges generally implied more or less of Greek study in college. Since then the ratio of bachelors of arts who never studied Greek has been steadily increasing, of late rapidly. No other academic degree ever necessarily implied an acquaintance with Greek, though bachelors of divinity nearly always had studied it a little, at least in the New Testament; of course many lawyers and physicians had taken a college course, with Greek, before beginning professional study. Exact figures are not obtainable; but probably not over one tenth of American young men or young women now studying for the A.B. degree take any Greek in college, and the ratio is diminishing. Where Greek is not required for entering the department leading to the baccalaureate in arts, elementary courses in Greek, wholly optional, are regularly offered. On the other hand, the opportunities for Greek study in college, for those who wish and are prepared to take them, have been greatly increased. Early in the eighteenth century Homer and the New Testament were still the most important, in many cases the only, Greek books read. Not until the nineteenth century was the range much enlarged; American colleges then, like the corresponding institutions of Germany and Great Britain, accorded to Greek a higher esteem and a larger place than it had ever received before. At present, since colleges are of all grades of strength, advancement, and inclination toward classical study, all grades of opportunity are offered in them, from the minimum recognized two hundred years ago, to the maximum in the ten or a dozen best. In the latter are regularly offered courses in Homer, the drama, orators, the historians, Theocritus, and Pindar. In general the college canon includes in each branch of literature portions, at least, of all the greatest books, those which have had most subsequent influence and which contain most of intrinsic literary interest. The situation in Canadian colleges is much the same, though these naturally show closer relations with English usage, and more distinctly favor, for students inclined to take Greek, earlier specialization and a wider range of reading than any in the United States, with the possible exception of Harvard.

In Schools. — The schools of different countries have developed on such different lines that comparisons in regard to any branch of study are difficult to make and are peculiarly open to misunderstanding. And as was said above, school and the faculty of arts in the university are not always clearly distinguishable. In the following sketch of the place of Greek in the schools, only Germany, France, and England will generally be considered, as most nearly concerning America. It is impossible here even to summarize the complicated and interesting history of Greek study. For three centuries textbooks and methods of teaching, judged by present standards, were extremely defective, and results appear to have been small for the mass of the pupils. The fruitful labor of a few great scholars, the profound effect of Greek study on a few receptive and strong minds, who became, largely in consequence of their saturation with Hellenism, a powerful influence on their contemporaries and immediate successors, stand in sharp contrast with the slight tincture imparted to the majority. The intense interest in Greek during the earlier Renaissance soon declined in Italy. Political conditions never favored a high development of education there, even among the upper classes, until the establishment of the present kingdom. Ecclesiastical education, though it continued to include Greek, did not aim at the fullest mastery of the subject. It was in Protestant Germany and England that Greek literature was most highly esteemed, permeated most thoroughly the highest intellectual life, most strongly influenced the men who created the modern classics, and has held the largest place in the school training of the educated class. (See earlier section of this article.)

For *German schools* a new era began with the reorganization of the Prussian educational system after the humiliation of Prussia by Napoleon; the founding of the University of Berlin in 1810 was part of the same movement. The school which led to the university and was intended for the early training of all members of the learned professions and all higher state officials, which was, however, open to all boys whose parents could send them, was the gymnasium. This was meant to be the stronghold and propagator of the New Humanism, the heart of which was the appreciation of Hellenism, as exemplified in all the makers of classical German literature, notably in Lessing, Goethe, and Schiller. Latin was given the largest place in the new gymnasium, but Greek stood beside Latin for the last six years of the course. And without passing through this course there was no entrance to the university, therefore none to a profession nor to high civic office. The Prussian schools, controlled by the State, were on the whole so superior that they became the general model for all other German states. Further, the privileges granted only to state schools made it impossible for good private schools for boys to grow up beside the state schools. The system as a whole amounted to a degree of propulsion toward the study of Greek such as England and America never approached; that of France was similar, but less rigid. Two large results followed. First, Greek was taught and learned with a thoroughness nowhere else equaled by so large a fraction of the youth of a country. Second, as mathematics, natural science, the native and other modern languages and literatures became more and more important for a liberal education, and yet could not be adequately recognized in schools that gave so much time to classics, the revolt against this educational monopoly was more justified and was strongest in Germany. The centralized state control made it harder than in America for public opinion to effect changes; but changes had to come. Under the present Emperor they have been coming rapidly, and are likely to go much farther; and Greek is the subject most affected by them. In two ways Greek is crowded out. First, students are now admitted to university privileges from other schools, without Greek; second, more room for modern subjects must be found in the gymnasium by restricting the time allotted to Latin and Greek. As one manifestation of the latter tendency, the plan of the so-called Frankfort system seems to promise most for the retention of Greek. By this plan Latin is not begun till the fourth year of the nine-year course, being preceded by three years of French. Greek is not begun till two years later, and is then studied intensively for four years. If this shortening of the time leads to the adoption of improved methods of teaching, along the line of the vastly improved teaching of modern languages that is now enforced in all Prussian secondary schools as in all French lycées, probably more Greek can be taught than was taught under the old plan.

In *France* the first Jesuit school was the

Collége de Clermont in Paris, later named Louis-le-Grand, now the Lycée Louis-le-Grand, founded in 1563. The schools of this order regularly gave much attention to Greek, and were the strongest educational force, alongside of the government schools, till the Jesuits were expelled from France in 1764. The statutes of the university, published in 1600 by the commission of Henry IV, show the influence of the Jesuit schools and of Sturm's system in Strasburg. While laying most emphasis on Latin, the statutes demanded considerable knowledge of Greek for admission to the upper division in philosophy. And the master's degree, including Greek, was the minimum qualification for the secondary teacher. In essence these requirements continued in force till 1793. The Revolution established the principle of universal public instruction, free in the lower stages; but the institutions intended to embody the principle attained no stability till 1808. Greek long continued to be required during four or five years in the course leading to the baccalaureate in letters, which again was prerequisite to the higher professional careers, though exemptions gradually increased. But by the regulations of 1902 a knowledge of Greek ceases to confer any formal advantage in regard to admission to any career — except, of course, that of a classical teacher. The distinguishing features of the new curriculum are these. After a preliminary course of primary study follow two successive cycles, one of four years and one of three years. In the first cycle there are two sections; one has no Greek or Latin, in the other Latin is required and Greek is optional during the two upper years. In the second cycle four groups are open; one alone includes Greek with Latin, two others include Latin with more extensive study of modern languages and of science respectively, one includes modern languages and science, without Latin. This arrangement, with accompanying privileges, goes beyond the present German system in leaving Greek to stand purely upon the popular estimate of its intrinsic worth. And unfortunately one does not gain from current reports any high opinion of the actual teaching of Greek in the French lycée. (See France, Education in, under Secondary Education.)

In *England* the establishing of classical schools in the sixteenth and seventeenth centuries was a widespread movement, as truly popular as any such activity could be in those times. It was always recognized that many who desired higher education, and who would by it be fitted to render public service in church and state, were sons of poor parents. Hence every educational foundation provided in some form for gratuitous teaching, or partially gratuitous, of a certain number of poor boys. In all such schools Greek was a firmly established subject of study by 1660, and has continued to be so. In the latter half of the last century a "modern side," without Greek, also became usual, and a demand for exemption from Greek for university entrance made itself felt. The newer universities do not require it, and the question is under discussion at both the older institutions. At Cambridge German or French is allowed as a substitute for Greek in the Regulations for the "Examination in Modern Languages for the Ordinary Degree," an innovation which probably foreshadows a like concession with regard to the requirements for the "Previous Examination." At Oxford, however, the proposal to make Greek non-compulsory in the cases of candidates presenting themselves for honors in mathematics and natural science was rejected in Congregation (November, 1911) by a majority of 236. As regards the preparatory schools the Report of the Curriculum Committee (1910) suggesting that Greek should not be commenced "until a boy had reached a certain standard in other subjects, such as English, Latin, and French," was laid before the Headmasters' Conference at Sherborne, but is still awaiting their formal consideration. But nowhere else is Greek more firmly intrenched in the estimation of the educated classes than in England and Scotland; this must have for a time a conservative effect in the schools. The amount of time traditionally given to the subject, however, must certainly be diminished, and also the number of those who drop out by reason of failure to attain, before the age limit, the standard set for the successive forms. It should be added, on the other hand, that youths to whom the subject is adapted, and who take the full training of a fine English school, including verse-composition, and then honors in classics at Oxford or Cambridge, obtain a fuller mastery of the Greek language and a deeper understanding of Hellenism than is imparted by the corresponding course of any other country.

In *America*, the English colonists, following the example of the mother country, began early to found grammar schools, in which Latin should be taught, and a beginning of Greek, in the New Testament. (See Grammar Schools.) Before the Revolution also the endowment of "academies" as another class of secondary schools (see Academies) had been well begun, and continued into the last century, to be succeeded by the still more popular movement for establishing free public high schools. One of the chief functions of the academy, as of the grammar school, was to fit boys for college; and hence to start boys in Latin and in the elements of Greek, the high schools were intended rather to furnish a better education for those who could not go to college. Preparation for colleges of the old type was for them always a secondary aim; and has been more and more subordinated as the other aim has broadened and turned more toward vocational training, or at least toward such teaching as would more directly facilitate bread winning. In the newer states, of course, where the state universities have always given more attention to applied science and purely modern subjects, the high schools of each state have stood in close connection with its university; but that brings them no nearer to Greek. The great increase in the number of pupils whose home speech is not English has been a large factor in this development of the high schools. Accordingly, while many of the earlier high schools included Greek in the curriculum, few, except large high schools, now do so, and many of the largest, as in New York and Chicago, do not. In many states, as Iowa and Minnesota, no high schools teach any Greek. The surviving grammar schools and larger academies generally teach it to those who desire it. Meantime, with the increase in wealth and advance in ideals of education, the demand has latterly been growing for proprietary and endowed schools of the highest class. (See Private Schools.) This has filled to overflowing the existing schools of this sort, and has brought into existence many new ones. These are largely, if not primarily, preparatory for college and technical schools, and hence include Greek for those who wish it. They may prove to be one of the strongholds of Greek instruction, since they are in a better position for adopting improved methods of teaching than are the teachers in public schools, and their advice carries more weight with parents and pupils. Finally, it should be mentioned that the Roman Catholic Church maintains not a few colleges and schools, including some for girls, in which Greek is taught. Also, some groups of immigrants from Germany have been active in providing classical teaching for their sons. Notably the Lutherans have a series of flourishing schools more closely modeled on the German gymnasium than any others in America.

Amid the conflicting currents of life in America it is difficult to sum up the present situation with reference to Greek study, and impossible to foretell the future. The materialistic trend of the whole modern world toward money-getting is hostile to studies that seem to have no direct bearing on that. On the other hand, the deep idealistic strain and the passion for the best that are so characteristic of the race that in America is slowly forming out of many heterogeneous elements, offer ground for hope. Whatever the teachers of Greek can lead their pupils to feel, in adult life, has been good in their own mental experience, will be kept and made available for their children. T. D. G.

GREEK, TEACHING OF. — It is well to begin with a clear idea of the end in view in learning Greek, as the first regulator of method in teaching it. Complete agreement as to that end there has probably never been; and in four centuries views have undergone many changes. The carefully limited statement of the Prussian *Lehrplan* of 1901 is: "An acquaintance, based on adequate knowledge of the language, with a certain number of literary works of special importance for content and form, and by this means an introduction to the thought and civilization of ancient Greece." Here is not a word that suggests any other purpose in studying Greek than in studying Chinese; the official directions to teachers hardly touch upon what is really the heart of the teacher's task; they tacitly assume, in the traditional way, that learning a foreign language is a radically different process if the language is ancient. Current formulas in England and America, however various in form, fall into two classes, according as they put in the foreground the content of the study or the effect on the student. But these two conceptions, instead of being opposed to each other, are simply two aspects of one mental activity; they may be reconciled in a single statement, comprehensive and brief. The starting point for this is a great historical fact, which may be put in the words of one of the best-known scientists of England and America, Sir William Osler: "The tap-root of modern science sinks deep in Greek soil, the astounding fertility of which is one of the outstanding facts of history. . . . Though not always recognized, the controlling principles of our art, literature, and philosophy, as well as those of science, are Hellenic" (*American Magazine*, December, 1910, p. 247). Corresponding to this undisputed fact of history, and somehow closely related to it, though we cannot here discuss the relation, is the following psychological fact, verified in centuries of experience. For minds not unadapted to it, the process of acquiring, under good instruction, a first-hand acquaintance with the Hellenic mind, as embodied in the existing works of ancient Greeks, is peculiarly formative, enlarging, disciplinary. No educational instrument yet known can fully take the place of this, as none can take the place of mathematics. This brings us to the simple and comprehensive formula: The prime object of Greek study is to gain a first-hand acquaintance with Hellenism, as a great force in civilization; the first aim in teaching Greek is to lead pupils to a personal acquaintance with that force. The disciplinary effect, the formal training, and all desirable ends, are included in that central aim, as auxiliary or incidental to it. That Hellenic force has been profound, lasting, pervasive. Along one line it even reached the extreme Orient, long before the Renaissance in Europe. It has recently been demonstrated that through Alexander's conquests, carrying Greek art to northern India, where Buddhism arose and matured, even China and Japan received from Hellas a potent influence on their sculpture and painting. And now this influence, carried eastward to the edge of Asia, has there met the broader stream that flowed westward through Europe to America and across the Pacific. Such far-reaching facts in the development of mankind must continue to urge all who would understand the intellectual world of to-day and the movements of history to know Hellas for themselves. And really to know Hellas is to take into one's self directly something of that original force, still unexhausted, still fertilizing the individual mind that is brought into real contact with the art, literature, and thought of ancient Greece. Such are the facts and experiences that must draw many of the stronger and more aspiring minds to this study.

When we would approach the Hellenic spirit most directly, it is embodied, first, in countless examples of Greek art still existing, more or less injured, in European and Asiatic Hellas, and in the museums of Europe and America; and secondly, in a copious literature. Where the former are accessible, as in our larger cities, no opportunity to become acquainted with them should be neglected. But for general educational purposes literature has this advantage over all other arts, that its originals can by printing be reproduced perfectly, cheaply, and in any number of examples. If we will, we can know these books nearly as well as any Greek could. Only we must first learn the language, for translations are but poor copies. In school and college the Greek language is to be taught and studied primarily as offering the only direct access to the great books. For while Euclid and perhaps a few other authors can be adequately read in translation, neither Homer and the dramatists nor Thucydides and the orators nor Plato and Aristotle can be so read. For these the content is inseparable from the original form. And unfortunately Greek is a difficult language. Its difficulties may be considered in four groups, which present themselves to students in the following order. First, an alphabet differing in part from our own. This is the least difficulty, but is serious during the first weeks. Second, a large vocabulary, far less represented in everyday English than is the Latin or French. Third, a rich inflectional system, especially for the verb. Fourth, a wide divergence from English in syntactical idiom, a divergence due chiefly to the third group of differences, the copious inflections. It is really the verb that is at the bottom of all serious troubles after the alphabet is learned; and too often the verb is neglected, with disastrous results. Taken altogether, it is not too much to say that as large a bulk of grammatical acquisition is required to prepare for the best colleges in Xenophon and Homer as that required for preparation in Latin and in elementary French and German combined. Nothing is gained by blinking these difficulties. It is better to face them, and attack them in order.

The first step in learning the alphabet is to copy out both capitals and small letters, the teacher indicating the best way of writing each where a question can arise. Some would follow the cursive manuscript forms now used in Greece. This has advantages; but unless one lives in a Greek-speaking community, keeping nearer to the usual printed forms leads more directly to the main goal. Next the names of the letters should be copied out, in Greek characters, the pupil pronouncing each one aloud repeatedly. The written accents are so troublesome that one is inclined to relax the requirement of strict accuracy at first, hoping to take them up more carefully later. That is a mistake; to correct a habit of inaccuracy once acquired takes more time and effort than does accuracy from the beginning. The fundamental rules are few, and the whole subject less difficult than English accent is for foreigners. And careful pronunciation should accompany every step. This raises the question, what pronunciation? As with writing, unless one lives in a Greek community, it leads most directly to our main goal, acquaintance with the *ancient* literature, to adopt the compromise in pronunciation which is recommended in recent grammars and by the Classical Association of England and Wales. The principle of this compromise is simple: to pronounce as the Athenians did about 400 B.C., as nearly as is practicable for our classes. The latter consideration leads us to adopt substantially the modern Athenian sounds for ϵ, ο, ϕ, θ, χ, and to give ω a closer sound than the ancient, like that of German ō; the ancient sounds in these cases would, for our classes, be so difficult as to demand for mastering them a disproportionate amount of time. For the same reason it is not thought worth while to attempt the ancient pitch accents; we pronounce them all, in the present Greek fashion, as we do the English stress accent. Long and short vowels, however, it saves time in the end to discriminate carefully; "hidden quantities" are few in Greek. To Plato no doubt our best reading would have sounded very barbarous, perhaps unintelligible. But so would our reading of Shakespeare's lines have sounded to Shakespeare; that does not make them less living to us. Some would see in this example an argument for the modern Greek pronunciation for ancient Greek. That, however, is to overlook the decisive differences in the two cases. The change in English since 1600 has not gone so deep that our pronunciation destroys all Shakespeare's rhythm, confounds the commonest words, and turns a phonetic spelling into an irrational chaos. The modern Greek pronunciation does all that for Sophocles. Considering the centuries that have elapsed, the Greek language has been conservative; some of the present characteristics began to appear before 300 B.C.; the popular speech of Greece is euphonious and expressive and has an interesting literature. But the wealth of the old literature was a constant force toward the retention of old spelling, while pronunciation inevitably changed. When, therefore, the modern sounds of the letters are applied to the poetry of twenty-three centuries or more ago, rhythm disappears, spelling becomes chaotic, and the language far harder to acquire. For an approximate illustration in English we should take, not Shakespeare, but Chaucer. To read his lines as verse we must return as well as we can to his pronunciation; in good teaching of Chaucer that is now done.

But precision in pronunciation on the system adopted is essential. This is one item in the application of the general principle that Greek, like any foreign language, should be taught as a living speech. As for "dead languages," of course Elizabethan English is really as dead as the language of Xenophon; the latter can be made to live for us in the same way as the former, and not otherwise. That is, ear, hand, and tongue must from the first be as accustomed to Greek words as the eye, precisely as in the best teaching of modern languages. The advance of recent years in teaching these, especially in France, Germany, and England, is even more needed, and is just as possible, in teaching Greek. " Read, write, speak " was the rule of the Jesuit schools three centuries ago; the notion that Greek and Latin are to be learned merely by reading, without accompanying oral use, belongs to the nineteenth century, and is a fundamental error. How much use can be made of conversation will depend on the knowledge and skill of the teacher; more use can be made than seems possible to one who has not persistently tried for it. But the principle is not bound up in any " method " ; what it requires is that by every available means the ear be trained to understand Greek words when spoken, and that the student be accustomed to reproduce Greek accurately, both orally and in writing. The better the teacher's own command of the language, the more he can vary these means, and the better results he will obtain. Also the more Greek can be used for saying what must be said in the classroom, the more rapid the progress. But any teacher can insist on good reading aloud, writing from dictation, translation from another's reading, and on reciting and writing from memory both paradigms and connected passages. By such exercises, too, one gains the power to go farther in that direction. There seems to be a physiological reason for the plain fact of experience, that a foreign tongue ceases to be alien and becomes a natural and living mode of expressing thought, only when, like the mother tongue, it is firmly held by all four kinds of language memory, those of the ear, hand, and voice, as well as that of the eye. To exercise all alike from the beginning makes the learner's progress more rapid, because at each step more secure.

For mastering regular Attic inflections, and of course for obtaining any considerable vocabulary, or a fair knowledge of ordinary syntax, two things are indispensable. These are a large amount of reading in easy Attic prose, and along with this, not after it as a special exercise, much reproductive use of the language. To both too little attention is given in American schools. Those who condemn Greek composition from the notion that this is taught as an end in itself, are attacking a man of straw; nowhere has it ever been so taught. But for learning to read any language accurately no other means can take the place of writing. And if to prepare pupils rightly for the examination in elementary French or German some two hundred pages of reading are requisite, how much Attic Greek must be read to obtain equal proficiency in the far more difficult language? Can one hundred and fifty pages of Xenophon suffice? Probably five hundred would be nearer the mark. The disproportion and the error of method in the usual practice are plain. Rereading and learning by heart, good as they are, do not meet the need. Too much rereading dulls the interest, and that is a capital mistake. What an eager young mind craves is variety, new combinations; the repetition that comes with these is more effective than twice that repetition through reviewing. For the vast apparatus of Attic conjugations, for the two or three thousand fundamental words, and for the common syntax, no single one hundred and fifty pages can offer enough combinations. Still more is this true of what we group together as idioms, the un-English ways of saying things, ways that grow naturally from the wealth of inflections, but are impossible in a language so little inflected as English. Just because they are unnatural to us, but are the warp and woof of Greek expression, the pupil must become familiar with a mass of them by meeting them in scores of variations; to repeat a few of the combinations a score of times is not enough. How to meet this difficulty is a serious problem, which we have scarcely faced, much less solved. The solution is to be sought in two places. First, a large amount of simple Attic prose, as varied as possible, should be read before the *Anabasis*. Disconnected sentences will not serve, for several reasons; first, because they are intolerably dull. And nothing read before the *Anabasis* should destroy the freshness of that interesting story by anticipating its distinctive vocabulary or its narrative; detached sentences that spoil both by anticipation are a pedagogical sin. In part the place must be filled by modern compositions. *A Greek Boy at Home*, by Dr. W. H. D. Rouse (London, 1909), whose experimental work in the Perse School at Cambridge (England) has for a decade been doing much for classical teaching, can be commended from personal experience as interesting and practical, and it can be taken up in the first week. It has the merit, too, of introducing early the commonest particles and idioms of sentence connection, which play so much larger a part than in Latin or any modern language. Later some parts of

Lucian can be used; when the need is more widely realized, a wider choice of suitable texts will soon be provided in convenient editions. Secondly, we must not be afraid to postpone a little the reading of Homer, that the immortal epics may be the better enjoyed. Colleges that have classes for beginners in Greek are as directly concerned as the schools in attacking such questions as these, though it should not be forgotten that details of the solution may be much affected by the age of the class and by their previous studies. We must here confine ourselves to general principles, observing that youths of fourteen or fifteen can learn paradigms, and perhaps can learn passages by heart, more easily than those of eighteen or older, while the arguments of the orators and the thoughts of Plato's *Apology*, *Euthyphro*, or *Crito* are harder for young people to comprehend.

Three topics, under the general subject of method, still demand a few words. First, six hours a week in the class are far more than twice as effective as three hours; less than five hours a week means a sad loss of efficiency in the first year of any foreign language. The secret of the rapid strides which children make in learning German when living in Germany is not in the increased number of hours given to study, but in the increase in the number of hours of exposure to German, with the constant gentle urging, which daily life brings upon them, to listen and talk as well as write and read. The classroom is a poor substitute for all that, but is the best we have; we should make as much of it as we can. Secondly, in the writer's experience, Greek syntax makes little trouble for pupils who have really learned the inflections. It is hazy notions about these that make syntax and syntactical idioms appear hard. The thing to emphasize constantly during the first five hundred pages of reading in Attic prose is the inflections, particularly of verbs; without a firm grip on these a student can have no real knowledge of Greek, but only invertebrate and feeble notions, which were better replaced by a real knowledge of French. And a teacher must not expect this mass of forms to be fully digested until several hundred pages have been read, with much reading aloud and writing and much reviewing of set paradigms. Thirdly, what is commonly known as "sight reading," if treated as a separate exercise and as somehow distinct from right reading, is a snare and a delusion. Reading is merely taking the writer's meaning from his words, written or printed. Reading Greek or French is not different in that respect from reading English. The pages a pupil is set to read should be properly graded to his previous attainment. That being assumed, every sentence should be first read as well as possible at sight. That is, the pupil should be trained always to take the sentence as it comes, gathering the meaning as he proceeds, from all the indications before him. Precisely as, in learning the mother tongue, children enlarge their knowledge mostly by inferring from the context and the situation, so a great deal that is new can be inferred on every page. For some months all this new reading should be done in class, the teacher giving the meaning of new words when this cannot be inferred, but guiding the class to make all needed inferences that can be made on the basis of what they already know. This practice both increases speed and habituates to the right method, while it still leaves plenty for the pupil to do in revising the same passage for the next session. But any kind of reading which cultivates a habit of stopping short of a close approximation to the writer's exact meaning is vicious. The purpose of those who first gave vogue to "sight reading" was to increase the pitifully small amount of reading then usually done; the purpose at least was good.

The above outline deals only with the teaching of the language in the early stages. For a few suggestions on the teaching of Xenophon and Homer, see under those headings. This is not the place for the discussion of method in the more advanced work of the college, after a fair reading command of the language is acquired. T. D. G.

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See the files of the *Journal of Education* (London) and *School World* (London), especially since 1910, on the status of Greek at Oxford.

GREEN, ASHPEL (1762–1848). — Eighth president of Princeton University; was graduated from the College of New Jersey (now Princeton) in 1783, and was for three years instructor (1783–1787) and twelve years president (1812–1822) of the college. He was subsequently president of Jefferson Medical College in Philadelphia. Author of numerous sermons on education, one on *The History of the College of New Jersey.* W. S. M.

See Princeton University.

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GREEN, THOMAS HILL (1836–1882). — English philosopher; was born Apr. 7, 1836, at Birkin in the West Riding of Yorkshire, the son of Valentine Green, the rector of the parish. After his schooldays at Rugby (1850–1855), he went up to Oxford, where he spent the rest of his life as a student, fellow, tutor, and professor of Balliol College, gaining first-class honors in the school of *literæ humaniores,* and winning the chancellor's prize for an essay on works of fiction. Until his election to the Whyte professorship of moral philosophy in 1878, which he held to the day of his death, Mar. 26, 1882, he served his college as lecturer and tutor in various historical and philosophical subjects. After the election of Benjamin Jowett (*q.v.*) as master of the college in 1870, the subordinate management of the same devolved almost entirely upon him. As an assistant commissioner of a royal commission appointed in 1864 to inquire into the education of the middle classes, Green inspected endowed, proprietary, and private schools for boys and girls, and the views expressed in his report were largely those adopted by the commissioners. Throughout his life he showed a strong interest in the reform of middle and higher education, setting forth his ideas in the report already mentioned (*Schools Inquiry Commission,* 1868, Vol. VIII), in *Lecture on the Grading of Secondary Schools, The Elementary School System of England,* and *The Oxford High School for Boys.* He was also keenly interested in all practical, political and social reforms, and showed a warm sympathy for the humbler classes. His chief works are his *Introductions* to Hume's *Treatise on Human Nature* (first published 1874 in Hume's *Works,* edited by Green and Grose), *Prolegomena to Ethics,* published after his death by A. C. Bradley (1883), and *Principles of Political Obligation,* all of which, except the *Prolegomena,* are to be found in Nettleship's edition of his works, three volumes, 1885. Green's philosophical standpoint is that of objective idealism, which he developed under the influence of the German school, becoming the leader of a strong reaction against the traditional English empiricism (*q.v.*) as represented by Hume, Mill, and Spencer. His theory of ethics is based on a spiritualistic metaphysics: morality, like knowledge, can be explained only on the assumption that an eternal mind reproduces itself in human personality. Against utilitarianism Green teaches a doctrine of self-realization, in which, however, the social side of man's nature is emphasized; man cannot think of himself as satisfied in any other than a social life in which the exercise of self-denying will is exhibited, and in which all men shall participate. F. T.

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GREENE, GEORGE WASHINGTON (1811–1883). — Educator and textbook writer; educated in the common schools of Rhode Island and at Brown University. He was professor at Brown for four years, and was the author of textbooks in history, geography, and French. W. S. M.

GREENE, SAMUEL STILLMAN (1810–1883).— School superintendent, born at Belchertown, Mass., on May 3, 1810, and graduated at Brown University in 1837. He was instructor in the Worcester Academy and the English High Schools at Boston, superintendent at Springfield and at Providence, and professor of education in Brown University (1855–1875). Author of *Schools and Libraries,* five textbooks on grammar, and many articles in educational journals. One of the presidents of and for many years active in the American Institute of Instruction (*q.v.*). W. S. M.

GREENLAND, EDUCATION IN. — Greenland is a colony of Denmark; only the western coast up to 73° 30′ N. and the tract around 66° N. on the eastern coast are colonized. It was first settled and named by Eric the Red (985 A.D.), who thought that an attractive name would draw colonists. His farm Brattahlid at Ericsford (Tunugdliarfik), ruins of which may still be seen, soon became the center of a settlement on the southern part of the western coast. Later on another settlement was founded farther north on the same side of the country. During the reign of King Olaf Tryggvason, Christianity was introduced, and the churches of Greenland were, with the other Scandinavian churches, joined to the diocese of Bremen. In 1124 Greenland received its own bishop at Gardar (Igaliko). The government was similar to that of Iceland, an aristocratic republic; but in 1261 the Greenlanders voluntarily became subjects to the king of Norway. During its most prosperous epoch it is estimated to have had about 300 farms, 190 of which, with twelve churches and two monasteries, were located in the southern settlement. After the ravages of the Black Death in Norway (1349–1350) the Colony was neglected, and after various misfortunes the country became lost to the world and remained a blank for *c.* 200 years until the period of explorations under Davis, Hudson, and Baffin. But communication with Greenland was extremely meager until the Norwegian missionary Hans Poulsen Egede, the Apostle of Greenland, established the settlement Godthaab on the west coast in 1721; he sought in vain for descendants of the Norsemen and began to introduce Christianity among the Eskimos. Moravian missionaries began their activity in 1733 and continued till 1900. The population of Greenland in 1908 numbered about 13,300, including 300 Europeans, almost exclusively Danes; in the Danish colonies on the western coast the natives have a strong admixture of European blood. The state of the church and public instruction is established by law of April 1, 1905; it comes directly under the Minister of Public Instruction in Copenhagen. The bishop of Sjælland is also the bishop of Greenland, which forms a separate ecclesiastical district. In 1909 there were fifteen ministers in Greenland (in 1890 only three). For the education of ministers there is a Greenland seminary in Copenhagen, where all Danish theological students who desire to become ministers in Greenland must pass an examination. The native ministers are educated first at a seminary in Godthaab and continue at the Copenhagen seminary. The school-teachers are in part educated at Godthaab, in part at special schools conducted by the higher clergy. The common branches taught in the elementary schools are: religion, reading and writing of the Eskimo language, arithmetic, elementary history, and geography. All instruction in the seminaries and in the primary schools is gratis. Christianity is professed by all the population in southwest Greenland; an Eskimo who cannot read or write is rarely met with; the Eskimos have a printing office, and a newspaper in their own tongue. T. J.

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GREENLEAF, BENJAMIN (1786–1864). — Educator and author of mathematical textbooks, was born at Haverhill, Mass., on the 25th of September, 1786, and was educated at the Atkinson (N.H.) Academy and at Dartmouth College. He was first principal of the academy at Haverhill, and for twenty-four years (1814–1836) he had charge of the Bradford Academy. He was interested in the training of teachers, and in 1839 he organized a teachers' seminary which he conducted for nine years. He was the author of a dozen widely used mathematical textbooks, and of numerous articles in educational journals. He died at Bradford, Mass., on October 29, 1864. W. S. M.

GREENSBORO FEMALE COLLEGE, GREENSBORO, N.C. — An institution for the education of women chartered in 1838 under the control of the Methodist Episcopal Church, South. Collegiate, business, music, art, and expression departments are maintained. Fourteen units are required for admission to the college courses which lead to the degree of A.B. There is a faculty of eighteen members.

GREENVILLE COLLEGE, GREENVILLE, ILL. — A coeducational institution established in 1855, originally for the education of women only. It has been under the auspices of the Free Methodist Church since 1892. Preparatory, collegiate, theological, education, commercial, music, art, and oratory departments are maintained. The requirements for admission are fifteen units of high school work. The degrees of A.B., Ph.B., and B.S., are granted after the completion of the necessary courses. The faculty consists of nineteen members.

GREENVILLE FEMALE COLLEGE, GREENVILLE, S.C. — Founded in 1854 under the auspices of the Baptist State Convention of South Carolina, maintaining kindergarten, primary, normal, academic, and collegiate departments. There are no stated entrance requirements. There is a faculty of nineteen instructors.

GREENWOOD, ISAAC (1702–1745). — Author of the first American textbook on arithmetic, was graduated at Harvard College in 1721, and was professor of natural philosophy in the college from 1728 to 1738. In 1729 he published his *Arithmetic, Vulgar and Decimal.* This was twelve years after the publication of the English book by Hodder in this country, and fifty-nine years before the appearance of the popular American textbook by Pike.

W. S. M.

GREER COLLEGE, HOOPESTON, ILL. — A coeducational institution established in 1891. Preparatory, normal, collegiate, business, music, and elocution courses are offered. There are no stated entrance requirements. The college courses which are based on about ten points of high school work lead to degrees. There is a faculty of twelve members.

GREGORY, JOHN MILTON (1822–1898). — State superintendent, educated at the Poughkeepsie Academy and at Union College, graduating at the latter institution in 1846. He was principal of academies in New Jersey and Michigan, state superintendent of public instruction in Michigan (1859–1864), president of Kalamazoo College, and of the University of Illinois. Author of *Seven Laws of Teaching*, *Duty of Christianity to Educate*, and of articles in educational journals. He was editor of the *Michigan Journal of Education* from 1854 to 1859.

W. S. M.

GREGORY OF NAZIANZUS or GREGORY THE THEOLOGIAN (*c.* 325–390). — Son of Gregory, Bishop of Nazianzus. His education was at first under the direction of his admirable mother, Nonna; later he attended the schools at Cæsarea in Cappadocia, Cæsarea in Palestine, Alexandria, and Athens. At the last school he studied for several years, devoting himself to oratory under the most eminent sophists of the time, Himerius and Proæresius. Like his friend Basil (*q.v.*), he planned to become a teacher; like him he followed the calling for a short time, and again like him he gave up the career of teacher for the ascetic religious life. He was a man little suited to the ecclesiastical career afterwards thrust upon him. Basil, who had become Bishop of Cæsarea in Cappadocia, one of the most important sees in the Church, overpersuaded Gregory to permit him to consecrate him Bishop of Sasima in 361, a see which he soon forsook to act as coadjutor to his father. He afterwards went to Constantinople where he worked successfully in maintaining the Nicene faith against the predominant Arianism of that city. When Theodosius became coemperor of the East and came to Constantinople, Gregory was at once taken into high favor, was made Archbishop of Constantinople, and presided at some of the sessions of the Second General Council, A.D. 381. Party intrigue, taking advantage of technical irregularities in his appointment to Constantinople, forced him to resign. He left the city and spent his last years in Nazianzus. Gregory was equally great as a theologian and as an orator. As a theologian, his treatises determined some of the lines followed by Greek Christianity; as an orator, his compositions are among the best of all time and have been taken as models by some of the greatest modern pulpit orators, notably Bossuet. His connection with education was not that of a leader. He took part in the preparation of poems to serve as Christian reading books when Julian forbade Christians to use the heathen classics; he assisted Basil in the preparation of his Monastic Rule; and his apology for his flight from Sasima has been of no small influence upon treatises on the duties and education of the priesthood, especially on Chrysostom's work, *On the Priesthood*, and the *Pastoral Rule* of Gregory the Great (*q.v.*).

J. C. A., JR.

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GREGORY OF NYSSA (331–395?). — The younger brother of Basil of Cæsarea (*q.v.*) and one of the leading theologians of the Greek Church. He does not seem to have enjoyed the same advantages of a liberal education which fell to the lot of Basil, yet in intellectual ability he was superior to his brother and left an even deeper impression upon the theology of the Greek Church than did the better trained man. In his early life he was a teacher of rhetoric but made no great success of his work, probably on account of his inability to deal with the unruly youth with whom he had to come into contact. The edict of Julian in 361 forbidding Christian teachers to use classic authors in their instruction was for a short time a severe blow to all engaged in the work of education. Gregory certainly seems to have been quickly discouraged, for in the next year we find him, though he had previously married, in a monastery founded by Basil. His ordination as Bishop occurred in 372 when Basil put him into the insignificant village of Nyssa as Bishop in order to serve as a bulwark of Nicene orthodoxy in that part of the province of Cæsarea. He was exiled under Valens, the Arian emperor, in 374 but was able to return to his see four years later. He was present at the council of Constantinople in 381 and again in 383 and 394. To what extent he remained at Nyssa is not clear, as bishops had a custom of absenting themselves from their sees for long periods and with little apparent justification. After 394 he disappears from history, and probably died soon after that date, though when, where, or how is unknown. Gregory's great fame is that of a theologian. He was strongly influenced in his views by Origen (*q.v.*), more so even than were Gregory of Nazianzus (*q.v.*) or Basil (*q.v.*). In spite of this characteristic, which as time went on came to be regarded more as a defect and mark of heterodoxy in a theologian, Gregory retained his place as one of the leading theologians of the Church on account of his masterly treatises on the Nicene definitions of the faith. In the realm of pedagogy he takes a place on account of his work entitled *The Great Catechism*, which was a summary of the Christian faith intended to serve as a textbook to be used for religious instruction. In many respects it recalls Origen's dogmatic treatise, *De principiis*, but is much briefer and better rounded out in its form.

J. C. A., Jr.

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GREGORY OF TOURS (538–294). — Bishop of Tours and historian of the Franks. Gregory was born at Averna in 538 and was educated by his uncle Gallus, Bishop of Clermont. In 573, although but twenty-five years of age, Gregory was made Bishop of Tours, one of the most important sees of Gaul. In this post he took an active part in the work of the Church, which in the troublous Merovingian times was the one institution of culture and education remaining in Gaul. His chief work and that by which he is generally known is his famous *History of the Franks*. Its style is marked by crudities of taste and grammar, which have been constantly pointed out as indicative of the intellectual degeneration of the times and the poor estate into which education had fallen. It should be noted, however, that Gregory is quite aware of the fact that he does not observe the niceties of classical grammar, admits his rudeness of style, and in the first book of his history asks pardon for these faults. It would appear, therefore, that Gregory enjoyed more educational advantages than might be concluded from a comparison of his style not merely with the classical authors but with writers later than Gregory himself, and that he used a current form of Latin which came more easily to his hand than the older Latin which had not yet become sufficiently distinct from the vernacular to be regarded as the object of special study. In fact Gregory's language, though often rude and obscure, merely displays the characteristic features of the process whereby the classical Latin became the Romance and eventually the French language. His work is, therefore, of interest not merely to the historian but also to the philologist and student of the history of education.

J. C. A., Jr.

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GREGORY THAUMATURGUS (*c.* 217–270) Pupil and panegyrist of Origen (*q.v.*) and Bishop of Neo-Cæsarea. Gregory was a native of Pontus, having been born in Neo-Cæsarea. His family was of high social rank and in early youth he was destined for a public career and was set to study jurisprudence with that purpose in view. He started, while still young, for Berytus (*q.v.*) in Syria, famous for its school of Roman Law, but passing on his way through Cæsarea in Palestine, he chanced to meet Origen who at that time was teaching there. He was so attracted by the great Alexandrine that he remained with him for five years, entirely abandoning his visit to Berytus. In the end he became a Christian. On leaving Cæsarea in 238, he delivered in the presence of Origen a panegyric on his master in which he gives an elaborate account of the methods employed by him in his teaching. This panegyric is, therefore, a document of the first importance in the history of education and especially for the history of the early Christian schools, since it gives an elaborate description of methods employed and the curriculum followed by one who was eminent as an educator. An English translation by S. D. F. Salmond may be found in the translation of the works of Gregory Thaumaturgus in the *Ante-Nicene Library of the Fathers*, Vol. VI, Am. ed. The subsequent career of Gregory was different from the plans of his parents. He returned to Cæsarea to practice law, but in 240 was chosen Bishop of the small Christian community in the place. He remained at the head of the Church for thirty years giving himself with most exemplary zeal to his work and winning large numbers to Christianity. There is no evidence that apart from his work as a Christian pastor and bishop he ever taught or that he formulated any independent pedagogical theories. He derives his title of Thaumaturgus, or Wonderworker, from the reputation which he seems to have acquired even during his lifetime as a worker of miracles, many of which verge upon the grossly fabulous.

J. C. A., Jr.

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Migne, J. P. *Patrologia Græca*, Vol. X. Col. 963 ff. (Paris, 1863.)

GREGORY THE GREAT (540–604). — Bishop of Rome (590–604). No single figure is more prominent in the sixth and seventh century than Gregory I, Pope and Doctor of the Church. No one has left behind him a more abiding mark upon the life of Western Europe. Under his lead the papacy became for the first time an important political power throughout the West. He organized its finances and consolidated its possessions. Through him the theology of St. Augustine (*q.v.*), the greatest of the Latin Fathers, became dominant in the West, but only so far as Gregory had appropriated it and in the form in which he had interpreted it. By his work the organization of the Church was rapidly advanced and the foundations were laid for still larger developments. It is, therefore, not surprising that he also profoundly affected the development of schools and influenced the intellectual life of the centuries that followed his pontificate. His education was thorough in grammar, rhetoric, and logic, or that general training which a young man received who was preparing for a public career. Later he studied law and at thirty was appointed *Prœtor urbis* by the Emperor Justin II. He soon gave up his promising career, disposed of his patrimony in charity and the endowment of monasteries in Sicily and elsewhere, and became a monk. But the Church was not willing to see him buried in a monastery and he was ordained by Pope Benedict I before 578 and soon after was sent to Constantinople as *apocrisarius*, or papal legate, at the imperial court. From 585 he was at Rome, abbot of the Monastery of St. Andrew, which he had himself founded. In 590 he became Pope and for fourteen years administered the see of Rome as none before and few after him. His political responsibilities were no less than his ecclesiastical. His relations with the Lombards, his mission to England, under Augustine of Canterbury, his dealings with the Franks and the Eastern Empire are only some of the larger relations in which he stood with the world of his times.

As connected with education Gregory is in some respects the most important of the Church Fathers of the West, on account of his relation to the *schola cantorum* at Rome, his treatise on *Pastoral Rule*, and his influence upon the study of classical literature. These three points will, accordingly, be discussed in this order. (1) Gregory is the reputed founder of the *schola cantorum*, or Roman singing school, as well as reformer of ecclesiastical singing. Neither statement is strictly true. The fact appears to be that the *schola cantorum* was in reality the *Orphanotropium* that had been in existence in Rome for two centuries. The principal authority for the connection of Gregory with the founding of the school is John the Deacon, a writer of the latter part of the ninth century, who says that Gregory " founded a school of singers, endowed it with some estates and built for it two habitations, one under the steps of the Basilica of St. Peter, the Apostle, the other under the houses of the Lateran Palace," and that Gregory gave instruction in the school so founded. Indeed, the chair in which he sat while teaching, and his whip used to maintain discipline, together with the *antiphonarium* from which he taught were preserved in the ninth century. What he did, amounted no doubt, to the refounding of the school by the increase of its endowments and the impetus he gave to the study of singing as well as of other branches in the school. The reason for this increased attention to the training of the young for singers was due to the reform which Gregory carried through in the matter of singing in the divine service, by which singers were specially trained in the school for the service of the altar. Following the example of Rome, singing schools were established in many places as part of the reform in the services of the Church inaugurated by Gregory. They were, however, more than institutes of vocal culture and in them were imparted the rudiments of Latin and reading, necessary for the intelligent performance of the duties of singers. In this way, in cathedrals at least, such schools arose everywhere and were especially ordered by the council of Aix-la-Chapelle 802. (Cf. Hefele, *Conciliengeschichte*, sec. 409.) These schools are to be distinguished from the schools for the clergy in which higher branches were taught. (See CATHEDRAL SCHOOLS.) As to Gregory's connection with the so-called Gregorian music there is little authentic information. The first mention of a *Cantus Sancti Gregorii* is by Leo IV (847–855). It is probable that the style of music, which was developed at Rome long after Gregory the Great's day, was known as the Gregorian style of music after the great patron of the school, in the same way that the style of music cultivated in the singing school of Milan was known as Ambrosian from St. Ambrose the great bishop of Milan. In later times the interest which Charlemagne took in music made the style of the Roman school everywhere common and the whole system was generally known as Gregorian.

(2) The *Book of Pastoral Rule* may be regarded as Gregory's principal contribution to the theory of education. It is in purpose and form a study of the duties of the bishop as pastor of his flock. When it is recalled to what an extent the moral instruction and training of the times lay in the hands of the clergy and especially the bishops, the significance of a book on such a subject, written by one especially competent for the task, becomes apparent. The treatise is especially concerned with the method of meeting various moral problems that might arise. Its worth was recognized immediately and it at once became very popular. A translation of it was made into Greek by Anastasius, patriarch of Antioch, at the command of the Emperor Maurice. King Alfred (*q.v.*) translated it into Anglo-Saxon. By Frankish councils under Charlemagne and Louis the Pious, bishops were required to study it with

special care. In the ninth century it even became the custom to give it to bishops at the time of their consecration as a part of the ceremony. In this way it became of universal importance as determining the spirit in which moral training should be undertaken.

(3) Gregory's influence upon the study of classical literature was not helpful and he did much to create the monastic sentiment that the study of heathen writers was incompatible with Christian living. It should be said that while Gregory was well educated technically, he nowhere shows that he had any appreciation for literary beauty, such as Jerome had, and that he had not the slightest conception of literature as an art form. He knew no Greek, for though he had lived for several years at Constantinople, he saw no need of studying it. In his practical spirit there was no place for love of literary excellence. The demands of the times were so urgent, the problems before the Church so tremendous, and the Church so unsupported in withstanding the collapse of all social and moral institutions that for a Christian and especially for a leader in the Church to spend any time on the study of literature as such seemed fiddling while Rome was burning. From this point of view is to be judged the letter of sharp rebuke he wrote to Desiderius, Bishop of Vienne, an enthusiastic student of the classics and a successful teacher of rhetoric and literature. (The letter will be found in the *Epistles of Gregory*, *Lib.* XI, ep. 54.) It is quite possible that the rebuke was merited; a bishop had something else to do in that period than teach literature, valuable as that teaching might be. But Gregory repeats the old saying that the praises of Jove should not be in the same mouth which praises Christ. For this Gregory merely repeated what had been said before by others. (See CHRISTIAN EDUCATION IN THE EARLY CHURCH.) In his own practice, Gregory did not hesitate to write carelessly and even boasted of his contempt for rules in his dedicatory epistle (*ad Leandrum*) prefixed to his *Moralia* on the book of Job. This contempt for the simple rules of correct style and the condemnation of heathen literature as unworthy of a Christian are undoubtedly to be interpreted from the situation in which Gregory was placed, an exaggerated asceticism and a false conception of the nature of the biblical narrative. But however they are to be understood, their effect was mischievous and lasting. They gave rise to even stronger condemnation by monastic writers who attributed their exaggerations to Gregory and sheltered themselves under his example. (Cf. Gieseler, *Ecclesiastical History*, Am. ed., Vol. I, p. 490.) But it should not be concluded that because Gregory did so condemn literature and literary style that all monks had the same low opinion of literature or the same contempt for grammar. Their condemnation even was in many cases a rhetorical flourish of ascetic writing, but such cannot excuse Gregory, who was a most downright and straightforward writer. J. C. A., JR.

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Realencyklopädie für Protestantische Theologie; contains a very extensive bibliography.
See also histories of the Christian Church such as those of Neander, Gieseler, Hergenröther, etc., and histories of Roman and Western Christianity, such as those of Langer (*Geschichte der Römischen Kirche*); Hodgkin (*Italy and her Invaders*); Milman (*Latin Christianity*).

GREIFSWALD, THE ROYAL PRUSSIAN UNIVERSITY OF. — The oldest Prussian university, having been established in 1456. It is situated in the province of Pomerania and owes its origin primarily to the Burgomaster, Heinrich Rubenow, an impetus to its establishment having been given by the fact that the University of Rostock (founded 1419) was transferred temporarily to Greifswald (1436–1443). In the earliest days of the institution, the chief emphasis was placed upon the faculty of law, not more than a single chair in medicine being provided for an entire century. After a period of decline it was reëstablished on a Protestant basis by Duke Philip I of Pomerania in 1539, and provision was made by him for a stated income. Again during the Thirty Years' War the institution was in constant danger of extinction. In accordance with the terms of the Peace of Westphalia (1648), Greifswald passed into the hands of Sweden; but the arrangements for a satisfactory financial basis made by the last of the Pomeranian dukes were respected by the new Swedish masters. The university struggled on until, in 1809, the property owned by the university was seized by France. The property was restored in 1813, and two years later, when the university was taken over with the rest of *Neuvorpommern* by Prussia, its property and income were left intact, as a result of which policy no contributions from the Prussian States were called for until 1874. This state aid amounts at the present day to about $160,000 annually.

The progress of the university has been slow but well maintained during the past century. Its medical faculty was especially prominent during the middle of the last century, and its theological faculty is renowned to this day. In 1834 an academy of political science and agriculture was associated with the university, but it was replaced by an agricultural middle school in 1877. A number of new buildings have been erected since the celebration of the four hundredth anniversary of the foundation of the university, including a hygienic institute, a library, and a theological *Studienhaus* (1897).

The library, the beginnings of which go back to the gift of the valuable private collection of Rubenow, contains about 200,000 volumes and 800 manuscripts. Greifswald was the second German university to institute a summer school or series of vacation courses (*Ferienkurse*) in 1893. They have proved quite popular, and annually attract a number of foreign students, special stress being laid for their benefit on courses in German language and literature.

Among well-known former teachers may be mentioned Baum, Bardeleben, and Budge in medicine; Gass, Reuter, and Cremer in theology; Balthasar, Beseler, and Windscheid in law; Ernst Moritz Arndt (*q.v.*) in history; Oberbeck in physics; and C. W. Ahlwardt in classical philology. During the winter semester of 1909–1910 there were 1058 students (91 women) in attendance, including 101 auditors (51 women). The matriculated students were distributed as follows: theology 118, law 205, medicine 211, and philosophy 423. R. T., Jr.

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GRENADA COLLEGE, GRENADA, MISS. — An institution for the education of girls, established in 1851 and now under the control of the North Mississippi Conference. Preparatory, collegiate, music, and art departments are maintained. About ten points of high school work are required for entrance to the college which gives the degrees of A.B. and B.L. on completion of the requisite courses. There is a faculty of thirteen instructors.

GRENOBLE, UNIVERSITY OF, FRANCE. — Founded in 1339 by a bull of Benedict XII. It was established under the influence of the University of Naples and there was no faculty of theology. The location and size of the town, however, were not favorable to the successful progress of the university and it had practically disappeared, when, in 1452, the University of Valence was established. It was revived in 1542 and theology was included. But the institution met with no greater success than at the first foundation and in 1565 it was amalgamated with the University of Valence, in spite of much protest and opposition. At the end of the eighteenth century there seemed a probability that the University would be reëstablished; but the partial reorganization did not take place until the general establishment of the University of France by Napoleon. In 1805 the faculty of law was established and with the exception of the years 1821–1824, when it was suppressed, has continued successfully till the present time. Under the July Monarchy the *École préparatoire de médecin et de pharmacie* and the faculty of letters and sciences were established. Finally, the three faculties were organized into a university by the law of July 10, 1896. Under the direction of the *Comité du patronage des étudiants étrangers de l'Université* a special course in French language and literature was established in 1898 for foreigners, and is given throughout the year. There are now three faculties, law, science, and letters, and preparatory schools of medicine and pharmacy. The university maintains a well-attended summer school, mainly in the interests of foreign students who desire to learn French. The enrollment in 1909–1910 was 1156 students.

See France, Education in.

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GRESHAM, SIR THOMAS (?1519–1579). — The founder of the Royal Exchange in London and of the Gresham College, London. It is not known to what school Gresham went, but his uncle, Sir John Gresham, converted the mansion house of Holt into a free grammar school in 1546, so that the family was evidently interested in education. At an early age Thomas was sent as a pensioner to Gonville and Caius College, Cambridge. About 1535, on leaving Cambridge, he went as an apprentice to his uncle Sir John, and also became a student of Gray's Inn. Sir Thomas Gresham became the most eminent and most wealthy merchant of his time, and by raising of loans made himself a man of vast political importance. Yet he never lost his interest in literary and academic matters. He first stated the famous economic law which bears his name. He erected his Burse or Royal Exchange in 1568, and in 1574–1575 he declared his intention to found a college in London for the free instruction of all who wished to attend the lectures. The public orator of the University of Cambridge (Richard Bridgewater) reminded Gresham of a promise he had made to give £500 either to an ancient foundation or a new college at Cambridge. An attempt was made to induce Gresham to give up the idea of a London college, which could not but be competitive to the older universities. In July, 1575, however, Gresham drew up his will, and laid down his bequest for a college to be the "Epitome of a University," and this was carried out on Gresham's death in 1579. His mansion house was, on Lady Gresham's death, to be handed over to the Corporation of London and the Mercers' Company. These bodies were to nominate seven professors, to lecture, one on every day of the week, on the seven sciences of divinity, astronomy, music, geometry, law, medicine, and rhetoric. The salaries were to be fixed at £50, the purchasing power of which may be put at ten times that amount to-day. The professors were to be unmarried men, and to have rooms allotted them in the house, and free access to the gardens belonging to it. The rebuilding of the Royal Exchange after the Great Fire of 1666, absorbed the large revenues of the Gresham estate and the property available for the college demands, till in 1768 an act of Parliament disposed of it to the government in return for £500 a year — and an obscure room over the Royal Exchange was allotted for the lectures. In 1841 a separate building was erected at the corner of Gresham and Basinghall streets in London; and lecturers are still appointed to deliver courses in music, rhetoric, and divinity. The regulations drawn up in 1597 for the professorships are remarkable. The professors were to remember that the hearers will be "merchants and other citizens"; and therefore their lectures should be adapted to that kind of audience by being eminently practical. The divinity reader had the practical aim placed before him to "endeavor to confirm the truth of doctrine now established in the Church of England, and to refute the adverse party, and with just conscience and circumspection to sift out the true state of every controversy." Some of the foremost scholars or scientists of their day have held professorships at the college, including Isaac Barrow, Hooke, Petty, and Sir Christopher Wren, and the relations between the college and the Royal Society were intimate. The development of better facilities for higher education in London in the last century has tended to minimize the importance of Gresham College. But the trustees seem to be showing renewed activity and propose to build a new college to accommodate 500 students, remodel the curriculum, and to found scholarships. F. W.

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GRESHAM COLLEGE. — See Gresham, Sir Thomas.

GRIMKÉ, THOMAS SMITH (1786-1834). — Statesman and apostle of common school education in the south; was born at Charleston, S.C., on Sept. 26, 1786, and was graduated from Yale College in the class of 1807. He was active in the organization of free schools in the southern states, and was one of the founders of the Western Literary Institute and College of Professional Teachers (*q.v.*), the first educational association organized in the United States. Author of *American Education* and *Science, Education, and Literature.* He died at Cincinnati in 1834. W. S. M.

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GRINNELL COLLEGE, GRINNELL, IA. — Formerly called Iowa College, a coeducational, nonsectarian institution, established in 1846 by Congregational pioneers in the territory west of the Mississippi River, under the influence of the "Iowa Band," consisting of six young men from Yale and Andover Theological Seminar. The institution was opened in 1848, and the first class was graduated in 1854. In 1859 an amalgamation was effected with Grinnell University at Grinnell. Women were admitted in 1860.

The institution maintains the usual undergraduate courses in arts and science, and in engineering. A school of music is also provided. Graduate courses lead to the degree of A.M. for one year's work in residence. The undergraduate work leads to A.B. and B.S. The group system was adopted in 1895. There are no college fraternities. Grinnell College is one of the institutions originally accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*). The present corporate title was adopted in 1909. There is a faculty of fifty-seven members. The student enrollment in 1911-1912 was 655. C. G.

GRIPPE (French, la grippe, — the term influenza is also frequently used). — A disease due, apparently, to a minute micro-organism — the influenza bacillus or Pfeiffer's bacillus — which invades especially the air passages. The relation of this bacillus to the disease is, however, still somewhat in doubt.

The symptoms of grippe are protean, the complications are many, and the after-effects are often serious. The disease seems to be usually spread from one person to another. Pfeiffer's statement is generally accepted: "A development of influenza bacilli outside the human body (in earth or in water) is not possible. The spread of influenza by dried or pulverized sputum can occur only in a very limited degree. Contagion is usually connected with the fresh, still moist secretion of the mucous membrane of the nose and bronchial tubes."

It frequently happens that ordinary colds are mistaken for grippe, and many of the so-called cases of grippe are really colds; but as a cold is a germ disease, and the means of preventing both colds and the grippe are apparently much the same, careful differential diagnosis is not as necessary as hygienic protection.

The reason that colds and the grippe are so prevalent and so serious among school children in many sections of the United States is probably the habit of sleeping in closed rooms and of keeping the schoolroom hot and dry, and the fact that when a child shows symptoms of a cold, instead of being put out of doors he is confined in the house. In many schools, under present conditions, the spread of grippe and colds is inevitable. The one important thing is to use the sovereign preventive and remedy which is always at hand, namely, fresh air. The school should be properly ventilated, and tubercular and anemic children should be taught out of doors; and in cases where children show the symptoms of a cold or grippe, or the like, it would be well to send the child home with a note to the parent from the school physician or nurse, reading somewhat as follows: " Your child ——— shows the initial symptoms of a cold or grippe, or something of this kind. If you can make it convenient to wrap him up warmly, to take care of him out of doors, and have him sleep for one or two nights out of doors or with the windows wide open, the cold air will probably effect a cure." Where there are school physicians or nurses, teachers should always bring children with suspicious symptoms to their attention. Where there are no such officials, it is well to communicate with the parents.

W. H. B.

See COLDS; CONTAGIOUS DISEASES.

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GRISCOM, JOHN (1774-1852). — An American Pestalozzian, was born at Hancock Bridge, N.Y., on Sept. 27, 1774, and educated in the Friends' Schools. He taught a district school for some years, and was principal of the academy at Burlington, N.J., from 1794 to 1807. For several years he conducted a private school in New York, and later he was professor in Queen's College (now Rutgers). The years 1818 and 1819 he spent in Europe studying foreign educational institutions and problems. He became keenly impressed with the work of Pestalozzi at Yverdun, and returned to America and became a propagandist of the doctrines of the Swiss educator. Griscom was one of the leaders in both the American Lyceum Association (*q.v.*) and the American Association for the Advancement of Education (*q.v.*). He was the author of textbooks on grammar, geography, and physics; but his most important contribution to the literature of education was his *Year in Europe* (1819). This embodied the educational results of his travels and observations in the Old World. Henry Barnard said of this work: " No one volume in the first half of the nineteenth century had so wide an influence on our educational, reformatory, and preventive measures, directly and indirectly, as this." Griscom died at Burlington, N.J., on Feb. 26, 1852.

W. S. M.

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GROCYN, WILLIAM (1446?-1519). — The first scholar to deliver public Greek lectures at Oxford. Educated at Winchester College and New College, Oxford, he became a fellow of the latter in 1467. In 1481 he became divinity reader at Magdalen College, holding several livings at the same time. In 1488 he went to Italy, where he remained about two years studying at Florence under Politian and Chalcondyles. On his return he took up residence at Exeter College, where he delivered the Greek lectures in or soon after 1491. Grocyn belonged both at Oxford and in London to that remarkable center of English Renaissance culture which included More, Linacre, Colet, Lily, and Erasmus. Grocyn left Oxford about 1496, and held a living in London until in 1506 he was presented to the mastership of All Hallows College, Maidstone. Erasmus always referred to Grocyn in very high terms, and once as " the patron and preceptor of us all." Although he had the reputation of being a good Ciceronian stylist, no works of Grocyn's that are of any importance are extant.

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GRONINGEN, ROYAL UNIVERSITY OF, HOLLAND. — Established in 1614 by the estates of the Province of Groningen, with the faculties of theology, law, medicine, and philosophy. Groningen had been an important seat of learning in the Middle Ages through the school of the Brethren of the Common Life (*q.v.*) and that at the St. Martin's Church. Toward the end of the seventeenth century the enrollment of students was over 6000, the majority, of course, being Dutch. From that time, however, a decline set in, and at the beginning of the nineteenth century there were only 200 students. With the French annexation this university became an academy of the University of France (1811), only to be reorganized as a royal institution in 1815. Since 1876 the university again began to make great progress. Buildings have been provided by the town. The five faculties are theology, law, medicine, philosophy, and letters. In 1909 the enrollment was 485 students.

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Minerva, Handbuch der gelehrten Welt, Vol. I. (Strassburg, 1911.)

GROOTE, GERARD. — See BRETHREN OF THE COMMON LIFE.

GROSSETESTE, ROBERT (1175–1253). — One of the most influential scholars, divines, and statesmen of the thirteenth century. Born of humble parentage at Stradbroke in Suffolkshire, England, he rose to a position of great influence. His early education he may have received at the school of Lincoln, but he certainly studied at Oxford and then at Paris. In 1224 he became lecturer to the Franciscans at Oxford, and throughout his life evinced great interest in the friars, with several of whom he was on terms of great intimacy. His influence on the religious revival as Bishop of Lincoln, a diocese including about one third of England, and the democratic and national movements led by his friend, Simon de Montfort, in England in the thirteenth century, can but be mentioned here. In the field of scholarship his influence was no less, and his opportunity as the first recorded Chancellor of Oxford was unlimited. He was interested in the study of Greek and Hebrew, in Christian antiquity, in physics and mathematics, in music and agriculture. He was a voluminous and versatile writer, and in theology alone he is credited with one hundred and forty-seven *dicta* on questions of doctrine and scripture, between two and three hundred sermons, and sixty longer treatises. In a truly scholarly spirit he always, where possible, went to the sources, and in science employed observation and experiment. He devoted himself to the study of Aristotle, but with an interest in the physical rather than the logical side. He wrote commentaries on the *Sophistici Elenchi*, the *Predicaments*, the *Prior Analytics and the Posterior Analytics*, and *Nicomachean Ethics*, the last of which he translated probably with the aid of others. Under his direction and encouragement, Nicholas of St. Alban's translated several works, including the *Testaments of the Twelve Patriarchs*. On the scientific subjects he wrote *Summa super VIII Libros Physicorum*, *On the Spheres*, a *Computus* (*q.v.*), and a *Computus Ecclesiasticus*. But his most important work was the encyclopedic *Compendium Scientiarum*, dealing with most of the then known subjects, and concluding with a chapter on the Unity and Simplicity of Knowledge. The metrical poem on table manners, *Stans Puer ad Mensam*, which has been attributed to Grosseteste, is probably of later origin. Grosseteste's influence among his contemporaries is best attested by Roger Bacon (*q.v.*), an otherwise keen critic, who says: "The Lord Robert (Grosseteste) alone . . . excelled all men in his knowledge of the sciences." Of Grosseteste and his friend, Adam Marsh, the Franciscan, he says elsewhere: "They were perfect in divine and human wisdom."

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Stevenson, F. S. *Robert Grosseteste.* (London, 1899.)

GROTE, GEORGE (1794–1871). — Historian, born at Clay Hill, Kent, England. After a short stay at Charterhouse, he entered at the age of sixteen the bank in which his father was a partner. He continued his studies, however, devoting himself mainly to classics and philosophy. At the time of the Reform Bill agitation he ranged himself with J. S. Mill (*q.v.*) on the side of rationalist individualism. He entered Parliament as the representative for London, and for a time achieved some success. He retired in 1841 from active political life, and in 1843 from business. Always inspired by high democratic ideals, he devoted himself to writing a *History of Greece* as the supreme example of the workings of democratic institutions. The work was planned as early as 1822, but the first two volumes did not appear until 1845, the twelfth and last in 1856. Written with a purpose, this work is marked throughout by the democratic leanings of its author, while on the social and economic side his practical experience served as an excellent basis for interpretation. In 1865 was published Grote's *Plato and the Other Companions of Socrates.* Another work, on Aristotle, was not completed when the author died. Grote took a strong interest in the movement for spreading opportunities for university education; and was President of University College, London, and Vice-Chancellor of the University of London; he also held the position of trustee of the British Museum. He died in 1871, and was buried at Westminster Abbey.

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Grote, Mrs. *Personal Life of George Grote.* (London, 1873.)

GROTIUS, HUGO (1583–1645). — Statesman, publicist, scholar, and theologian, born at Delft in 1583. He began writing Latin verse at the age of eight, entered the University of Leyden at eleven, and at fifteen began a commentary on Martianus Capella (*q.v.*), which had the approval of Joseph Scaliger. He took his degree in 1598, and accompanied Olden Barneveldt on an embassy to France, where he was presented by Henry IV with a gold chain. On his return to the Netherlands he began to practice as a lawyer at the Hague, and met with unbroken success. In 1609 he wrote his first work on international law, *Mare Liberum.* In the religious dispute which broke out in the Netherlands Grotius supported the Arminian views held also by Barneveldt, who was condemned to death with the approval of the Synod of Dort in 1619. Grotius was sentenced to life imprisonment, but through the aid of his wife was able to escape in 1622, and fled to Paris, where he was pensioned by Louis XIII. In 1625 he published the most famous of treatises on international law, *De Jure Belli et Pacis*, and a theological work, *De Veritate Religionis Christianæ*. In 1634 he entered the service of Christina of Sweden as ambassador to France. In 1645 he secured his recall to Sweden and hoped to be able to retire to his native land, since the decree of perpetual banishment passed on him in 1630 seems to have been forgotten. But he was only able to reach Rostock when he died.

Grotius was one of the most remarkable men of his age, and one of the earliest advocates of international peace. He holds an eminent position in each of the four fields of statesmanship, law, theology, and scholarship. As a scholar he is known for his translations from Greek into Latin verse, for annotations to Latin texts, for an unimpeachable Latin style. His work, *Annales et Historiæ de Rebus Belgicis*, is obviously modeled on the work of Tacitus. The *De Jure Belli et Pacis* has been translated into most languages, and on certain points is still regarded as authoritative. His views on the educational equipment of a statesman are concisely stated in the *Epistola ad Benjaminum Maurerium* (1615), a letter written to Maurer, an ambassador of the King of France, who had consulted Grotius on a course of study, presumably for himself. A man in the position of his friend, says Grotius, should be versed in philosophy, both speculative and practical, always bearing in mind that the two are complementary and that both are based on logic. He should study this subject in some simple and short compilation; Aristotle is too prolix. These subjects are to be followed by physics, especially that part dealing with the nature of our soul, and metaphysics, also in some short and concise text. In practical philosophy Grotius recommends the study of ethics and politics, through Aristotle's works and a summary of the best commentaries to be supplied by a secretary. For character studies the works of Euripides, Theophrastus, Terence, Horace (*Satires*), Plutarch, and Seneca should be read, to which might be added the *De Officiis* of Cicero. In politics the statesman should be acquainted with Aristotle, Polybius, Dio, Sallust, Cicero's *Letters* with a commentary by a Roman historian. A knowledge of rhetoric would be acquired through Aristotle, and the public speeches of Demosthenes and Cicero. A study of public law would be made in the *Laws* of Plato and Cicero, Aquinas (*Summa Theologiæ*), *Pandects*, Justinian, and contemporary publicists. Only then would the reader obtain any real advantage from a study of history in which the trend of thought rather than specific details should be followed. In history, says Grotius, it is best to work out from the present to more remote and ancient periods. Any further recommendations or details Grotius leaves to a future meeting. It will be noticed that in this rapid sketch Grotius is by no means ahead of the educational thought of his time, which sought all training for modern conditions in the works of classical authors. But coming from a man who must have known the needs of his position from his own experience, the *Letter* acquires an increased interest.

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GROUP CONSCIOUSNESS. — See SOCIAL PSYCHOLOGY.

GROUP GAMES. — See GAMES; PLAY.

GROUP INSTRUCTION. — The practice of separating the children of a single classroom into groups for the purposes of alternate instruction is called the "group system" of teaching. The group method is characteristic of the ungraded school of rural communities. It is much used in cities, regardless of the fact that the teacher may have only a single grade in his charge. It gives the teacher an opportunity to work with a small number of children at a time, and permits the children to have periods of study while their fellows are reciting. The grouping of children under this plan is not the same for all the subjects, thus providing for large flexibility in adjusting to particular subjects and individuals. The drawing and music might be taught to the whole grade at once, languages and history in two groups, and arithmetic in three. A given child, because of variation in his ability in different subjects, might be taught in the more able or advanced group in history, and in the least efficient group in arithmetic. H. S.

See INDIVIDUAL INSTRUCTION.

GROUP PLAN OF GRADING. — See GRADING AND PROMOTION.

GROUP SUPERVISION. — See SUPERVISION OF TEACHING.

GROUP SYSTEM. — See COLLEGE, AMERICAN (section on Administration of College Curriculum); COLLEGE; GRADING AND PROMOTION, for use of term in American schools.

GROVE CITY COLLEGE, GROVE CITY, PA. — Organized in 1876 as the Pine Grove Normal Academy, and incorporated as a college in 1884, reporting to the Presbyterian College Board. Academic, collegiate, and music departments are maintained. The entrance requirements are equivalent to fourteen units of high school work. The degrees of A.B., B.S., and Ph.D. are conferred. A postgraduate department is maintained, leading up to the

Ph.D. degree, for which only attendance at two summer schools and work *in absentia* are required. The total enrollment in 1910–1911 was 744. The instructors number twenty-three members.

GROWTH. — The question of physiological growth of children is of great importance in education. Up to the present studies have dealt largely with the establishment of normal age standards of growth. Much still remains to be done in correlating growth, attainments and educational progress. During life all the organs of the body undergo important structural and functional changes, and therefore present different characteristics at different ages. The physiological development of the body does not proceed at an equal rate in all individuals, who therefore do not all reach the same physiological development at the same ages, some being accelerated in their development, while others are retarded. The stage of development of the individual may be best observed in those cases in which a noticeable anatomical or physiological change accompanies the attainment of a certain physiological condition. The progress of ossification, the eruption of teeth, pubescence, the beginning of sexual maturity, the eruption of the beard, and in later life the menopause in women, the turning of the color of the hair, the appearance of wrinkles, and the diseases of old age, offer opportunities for observations. All of these show that the uniformity of physiological development is greater in young children than in older individuals. If the distribution of stages of development were a matter of chance, they would increase proportionally to the square root of the age; but the progress of their variability seems to be quite irregular and very rapid. The range of individual differences may be indicated by those ages within the limits of which one half of all the individuals observed attain a certain physiological development. Thus, in one half of all the individuals observed there occurs —

	Years	Interval Years
Birth between the limits of	–0.03 and 0.03	0.06
Eruption of the first incisors	0.46 and 0.74	0.28
Eruption of the first molars	1.4 and 1.8	0.4
Eruption of the inner permanent incisors of girls	5.9 and 8.1	2.2
Eruption of the bicuspids	7.1 and 10.9	3.8
Eruption of the permanent canines	10.6 and 12.0	1.4
Pubescence of boys	13.2 and 14.6	1.4
Menarchy	13.6 and 16.2	2.6
Eruption of wisdom teeth	20.8 and 23.2	2.4
Menopause	41.0 and 48.0	7.0
Death due to arterial diseases	53.7 and 71.3	17.6

It appears from these data that during school age the individual differences may be measured by a probable variability of about 2.5 years. These data refer only to the development of certain organs; but they are an indication of the variability of the development of the whole body, although nervous, muscular, osseous, etc., systems may each develop somewhat independently of the other. The measurements of children of the same age represent, therefore, individuals of different physiological developments; and these differences are the greater, the older the children. From this observation, and from the fact that during school age the variability of the stage of development remains about the same throughout, the conclusion must be drawn that during this time the individual differences in measurements, structural and functional traits, must be the greater the more rapid the rate of development and growth. Almost all measurements indicate that the rate of absolute growth of the organism is greatest at the time of birth, and shows a rather rapid decrease until the ninth year in girls and the eleventh year in boys. During the period of adolescence the rate of growth increases very much, and reaches a maximum, for girls about the twelfth year, for boys about the fourteenth year. After this the rate of growth decreases rapidly; and the skeleton has attained its full length with about seventeen years in females, with twenty years in males. Growth of muscles continues several years longer, and fat is added for many years. The central nervous system also continues to grow and develop. Owing to these conditions, the variability of anatomical, physiological, and probably also mental conditions of children is greatest during the period of most rapid growth, for girls of about twelve years, for boys of about fourteen years. These characteristics of growth have been observed for stature, weight, length of trunk, length of limbs, and measurements of the head.

Nevertheless the measurements of each organ exhibit characteristic features. Thus during childhood the limbs grow more rapidly than the trunk; the total amount of the growth of the head from birth until the adult stage is relatively small, the principal part of the development being completed before birth. The following table shows the amount of growth in stature, width of face, and length of head, from the fifth year to the adult stage, in per cent of the final size: —

	Males Per cent	Females Per cent
Stature	37	33
Width of face	16	15
Length of head	9	7

The annual increments for various measurements, obtained from long series and various types, show the following values (in millimeters): —

Ages	Males			Females		
	Stature	Length of Head	Width of Head	Stature	Length of Head	Width of Head
5–6 . . .	56	1.5	1.3	57	1.1	0.9
6–7 . . .	53	1.1	1.0	54	0.9	0.9
7–8 . . .	50	1.2	0.9	52	1.1	0.7
8–9 . . .	48	1.0	0.6	49	1.9	0.6
9–10 . .	46	0.9	0.7	50	1.2	0.7
10–11 . .	44	0.8	0.6	53	1.2	0.7
11–12 . .	45	1.0	0.7	59	1.4	0.8
12–13 . .	53	1.2	0.6	62	1.3	0.7
13–14 . .	64	1.5	0.9	48	1.3	1.0
14–15 . .	73	1.6	0.9	30	0.3	0.4
15–16 . .	54	1.6	1.0	15	0.3	0.1
16–17 . .	37	1.6	0.8	8	0.2	0.0
17–18 . .	24	1.0	0.6	4	0.6	0.2
18–19 . .	14	0.8	0.3	1	0.4	0.3
19–20 . .	7	0.9	0.4	—	0.0	0.2
20–21 . .	3			—		
21–22 . .	1			—		

The absolute measurements for New England school children are as follows: —

Males

Age	Stature	Height sitting	Weight	Length of Head	Width of Head	Length of Forearm	Width of Hand
6	1129	622	45.7	178.2	140.7	309	58
7	1179	642	49.7	179.6	142.1	319	60
8	1228	663	54.1	180.1	143.6	331	62
9	1278	685	59.4	181.2	144.0	344	65
10	1329	711	65.8	181.7	144.5	359	67
11	1374	727	71.3	183.4	144.6	373	69
12	1426	748	87.4	183.3	145.6	387	71
13	1479	771	86.9	185.2	146.8	405	74
14	1546	806	98.2	187.2	146.9	427	78
15	1620	842	113.8	188.3	148.1	445	80
16	1660	866	122.6	190.8	149.2	454	83
17	1686	885	132.7	191.6	149.5	—	—

Females

Age	Stature	Height sitting	Weight	Length of Head	Width of Head	Length of Forearm	Width of Hand
6	1120	616	43.8	173.1	138.0	304	58
7	1171	639	47.9	174.7	139.1	315	58
8	1221	660	51.9	175.0	140.3	328	60
9	1270	680	58.0	176.3	140.2	337	62
10	1330	705	64.1	177.8	142.1	357	65
11	1372	726	70.0	178.2	142.1	370	67
12	1443	758	81.0	180.0	143.2	382	70
13	1499	788	89.7	181.7	144.0	407	72
14	1539	815	100.6	182.5	144.0	413	74
15	1569	835	106.2	184.3	145.4	427	74
16	1572	840	108.7	183.7	144.6	422	74
17	1591	853	114.6	184.8	145.2	—	—

It appears from these data that the following relations prevail between the two sexes: stature, length of trunk and of leg, and weight, of girls are smaller than the corresponding measurements of boys until the period of prepubertal acceleration, which sets in earlier in girls than in boys. As soon as this period begins, about the eleventh year, the measurements of girls exceed those of boys. With the fourteenth year the period of acceleration of the growth of girls is passed; while the corresponding period begins for the boys, who from now on exceed the measurements of girls considerably. Length and width of head of girls are always smaller than those of boys of the same ages, and the same is true of the size of the face. At the same period, when the total stature of girls exceeds that of boys, the girls show an approach of their head measurements to those of boys, without, however, reaching them. In accordance with the more rapid rate of growth of the body as compared to that of the head, the ratio between head and body shows a constant decrease during the period of growth. The ratio is less in girls than in boys until the fifteenth year, when the continued rapid growth of the boy's body begins to depress this ratio under the value attained by the girl. The ratio between the length of the trunk and stature decreases until the thirteenth year among girls, until the fifteenth year among boys. Later on it increases again. Until the thirteenth year this proportion is about the same in both sexes. After this period the trunk of the girl is relatively longer than that of the boy. The face of girls as compared to the head is larger than that of boys, while the long-continued growth of the face of boys brings about a reversal of these relations after the sixteenth year. The cephalic index (ratio of length and width of head) shows a slight decrease during the period of growth. The head of girls is a little more rounded than that of boys. The width of hips is smaller among young girls than among boys of the same age, but it is ultimately much larger than the corresponding measure of men. All transversal diameters and circumferences continue to grow slightly for a long period.

Owing to the rapid increase of the rate of growth during adolescence, and its later still more rapid decrease, the distribution of the amounts of annual growth is very asymmetrical. For instance, among boys eighteen years old, many do not grow at all, while others show the characteristic rates of growth of boys fifteen, sixteen, and seventeen years old. The asymmetry of distribution of annual growth makes also all the series of measurements of statures, weights, etc., asymmetrical. The correlations between the various measurements are greatest during periods of rapid growth, owing to the fact that retardation and acceleration affect all the parts of the body at the same time, although not all to the same extent.

Little is known about racial differences in growth. All the series that have been taken show the same essential characteristics here described, but it may be that the periodic distribution of lesser and greater energy of growth is not quite equal in different races. It would be of great importance to investigate the question of early arrest of development of some races. This phenomenon, which might perhaps be correlated with an early arrest of mental development, has often been claimed to exist in the negro race, but no satisfactory proofs have been given. We do not know whether there is an earlier arrest of growth of the brain, earlier synostosis of sutures, and earlier arrest of post-pubertal development of the central nervous system. On the whole, all investigations that have been made tend to show that racial differences are present in young children, although not so markedly as in the adult, and that they increase in intensity in the course of growth. They become more marked in the male than in the female.

A considerable amount of information has been accumulated in regard to the influence of environment. It has been shown particularly that better economic conditions bring about a more rapid and also a greater development of the body than occurs under less favorable conditions. Among the poor the period of diminishing growth which precedes adolescence is lengthened, and the acceleration of adolescence sets in later. Thus the whole period of growth is lengthened; but the total amount of growth during this longer period is less than the amount of growth attained during the shorter period of growth of the well-to-do. Therefore we find throughout that a young child which grows slowly will continue to grow slowly until the period of adolescence sets in. Afterwards the child that has grown slowly during the early years of childhood will grow rapidly. It is not certain to what causes these phenomena must be ascribed, — whether, for instance, climatic conditions affect the period and total amount of growth. There is some evidence favoring this opinion, but no definite data are available. It is generally assumed that nutrition exerts a direct effect upon growth. This is true in so far as underfeeding diminishes growth; but it seems plausible that in the bulk of our population the better development of man in modern times is less due to better nutrition than to the fact that hygienic conditions of childhood have improved. These are expressed in a lessened infant mortality. It seems plausible that, with the diminution of the number of diseases that attack the individual, and the consequent elimination of their retarding influences, growth suffers less interruption, and that thus the final bulk of the body is increased. The differences between social classes are great. In American cities they are partly due to differences in the racial composition of the well-to-do and the poor, the latter group containing a larger proportion of immigrants; but in Europe they occur among groups of almost the same descent. The differences between these groups are partly due to a general retardation and acceleration; so that during the period of growth, the whole group of the poor are at any given time physiologically younger than the well-to-do. For this reason the differences between social groups seem to be greatest during the period of most rapid growth.

Other causes for differences of development lie in the size of family, urban and rural environment, and other causes whose mode of action is not by any means clear. According to some authors, natural selection plays an important part in these apparent changes which develop in the series of observed individuals; but weighty reasons speak against the acceptance of this theory, particularly observations on differences in type between parents who have grown up under one environment and their children who have grown up in a different environment.

Through the investigations of Porter and Crampton it has been shown that retardation of physical development is closely associated with retardation of progress in school. To the same causes which keep back the physical development of the child must be partly due its late entrance upon school life and its slow promotions. Children who are older than the average age of their grade are therefore, on the whole, physiologically retarded children; and those who are younger are, on the whole, children accelerated in physiological development. These observations make it plausible that the assumption which has been made so frequently — that a period of slow development of the body is correlated with a period of rapid development of mental faculties, and vice versa — is not correct, but rather that rapid physical and mental development go hand in hand. If during the period of rapid growth the child has to be guarded against overexertion, both mental and bodily functions are equally concerned. The close correlation between the two emphasizes the need of proper care of body and mind.

The study of growth has been applied extensively to the work of school gymnasiums, and as a result of this work numerous tables of so-called normal growth have been published. On the whole, the results of these studies have shown that temporary practice of the body may result in a temporary strong development of parts of the body; that, however, the greater part of these results is quickly lost as soon as practice is given up.

The methods of anthropometrical work have been developed in school and college gymnasiums and similar institutions, but also by students of anthropology. The instruments used are not very complicated, and are made and sold by the makers of gymnasium appliances and by large dealers in surgical instruments. On the whole, advancement of anthropometrical work has not been commensurate with the time and energy bestowed upon it, because no adequate provision has been made for its statistical discussion. A considerable number of tables of averages and of " percentile grades " have been published, in which the measurements of each individual are so placed that the per cent of individuals of the whole series are given who have lower values of the measurements than the individual in question, and it is then assumed that he should be in all respects on the same percentile grade, — an assumption that is entirely inadmissible. By far the greater number of data relating to growth have been obtained by a study of a large number of children of various ages, the so-called generalizing method. Only limited series are based on repeated measurements of the same children, the so-called "individualizing method." F. B.

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GROWTH, PHILOSOPHICAL CONCEPT OF. — See Development; Evolution.

GRUBE METHOD. — Grube (1816–1884) published his method of teaching arithmetic (*Leitfaden für das Rechnen*) in Berlin in 1842. It was a small manual, of no particular originality or merit, but on account of the translations made by Soldan (1878) and Seeley (1891) it became an object of interest a generation ago in the United States. Grube used the "concentric circle" idea of teaching number, a phase of the spiral method (*q.v.*), but it was not original with him, having been suggested by Krancke as early as 1819. The idea of the concentric circle arrangement is that the child should master all number relations within the circle 1–10, then those within the circle 1–100, then within the circle 1–1000. Grube also carried the use of objective work far beyond the point where it ceased to be helpful, thus weakening rather than strengthening the number concept. He also attempted to teach the four processes simultaneously, unmindful of their difference in difficulty and importance. The result was that his method was mechanical and uninteresting, serving its chief purpose in leading many American teachers to consider with greater care the early stages of arithmetical work. It illustrates the ease with which a narrow method can be created, and the danger that arises from following such a method.

D. E. S.

GRUNDTVIG, NIKOLAI FREDERIK SEVERIN (1783–1872). — Danish historian, poet, divine, and statesman, of great importance in the history of Danish education as the inspirer and founder of the People's High Schools (*Folkehöjskoler*), and thus of the revived nationalism of the country in the last century. Influenced by a visit to England in 1829–1831 and a study of the works of Fichte, Grundtvig devoted himself to uplifting the people, who were suffering under material and intellectual depression. He saw the only remedies in a revived patriotism and a living religion. In his *Brief Writings on the Historical High School* he attacks the Latin schools of his day as "schools for death," as he characterizes them, and pleads enthusiastically for people's high schools or "schools for life." Training was already provided for all kinds of professions; the new schools should train Danish citizens. Taking as the basis of these schools the *Royal Resolutions* of 1847, which he inspired, he proposed the establishment of institutions where peasants and artisans could receive an education in the mother tongue, national songs and the national history, mythology and folklore. Above all, instruction was to be oral, for the living word is of greater value than book learning, which is deadening. Intercourse between leaders of such schools and the students was to be free and democratic, for patriotic, self-respecting, loyal citizens were to be the outcome. In addition to this cultural education some insight was to be given into the constitution, economic resources, and industries of the country, with personal contacts so far as possible.

The first school opened under the influence of Grundtvig was opened in Rödding by Professor Chr. Flor in 1848, but the present system received its impetus from the school established by Kristen Kold with Grundtvig's assistance at Ryslinge in Fühnen in 1851, until at the present time they are spread over all the Scandinavian countries, and have representatives in America.

See Denmark, Education in.

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GUADELOUPE. — See French Colonies, Education in.

GUAM, EDUCATION IN. — The island of Guam, situated at the southern extremity of the Ladrone Archipelago, was ceded by Spain to the United States on Dec. 10, 1898, and on account of the convenient harbor affords a desirable naval station. By direction of the

President, the naval commander at that port assumed the government of the island. According to a census taken in 1901, the population was 9676 (4566 males, 5110 females). They comprised original inhabitants, called by the Spaniards *Chamorros*, *Tagal* settlers, and mixed people of Spanish and native ancestry. Nearly all the inhabitants could speak the Spanish language, and about 35½ per cent could read and write Spanish. They lived, as a rule, in small towns, which are said to have been in very neat condition. The American commandant at once issued orders for the government of the island, confirming such Spanish laws as did not conflict with those of the United States, and shortly after the new order of things was established, three schools were opened in the capital, Agaña, for teaching English, under the superintendence of Mr. H. H. Hiatt. Similar schools were soon started in other towns, especially Asan and Agat, the non-commissioned officers of marines ably seconding the efforts of the superintendent. A circulating library was also established in the capital. The first general order relating to education issued by the commandant, bearing the date Jan. 22, 1900, placed the schools under government control. Attendance was made compulsory for the ages of eight to fourteen. Sectarian instruction was prohibited, and it was required that the English language should be the medium of instruction as rapidly as the necessary teachers could be secured. The recent progress and status of the schools are shown by the following statistics from reports made to the United States Navy Department: —

STATISTICS PERTAINING TO GOVERNMENT SCHOOLS

YEAR OF REPORT	NO. OF CHILDREN OF SCHOOL AGE	ENROLLMENT			NO. OF TEACHERS	TOTAL EXPENDITURE
		BOYS	GIRLS	TOTAL		
1908	1392	896	692	1588	33	
1909	1471			1572	35[1]	$7335
1910	1730	977	813	1790	53	8142

[1] Native teachers only.

On the enrollment above given an average attendance has been maintained ranging from 96 per cent in 1908 to 95.6 in 1910. The number of teachers reported in 1910 includes enlisted men detailed for the schools in outlying villages, and eleven laborers from the commandant's office. During the year a building for school purposes was constructed at Agaña, at an expense to the island treasury of $2600. This increased accommodation will enable full-day sessions to be maintained for both boys and girls. Unfortunately, on account of the anticipated decrease in the revenues of the island, it has become necessary to drop a number of teachers for the new fiscal year. The natives seem anxious to learn, and competent teachers are especially needed to introduce manual training. A. T. S.

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GUARINO, BATTISTA (1434–1513). — Renaissance scholar, son of Guarino Veronese (*q.v.*), in whose school he gained such proficiency in learning as to be appointed professor of rhetoric at Bologna at the age of twenty-one. On the death of his father he was appointed to succeed him. Battista has left a brief account in the form of a letter to a pupil of the educational ideals and system of his father. In this work *De Ordine Docendi et Studendi* (*Concerning the Order and the Method to be Observed in Teaching and in Reading the Classical Authors*, 1459), the pursuit of letters is accepted as the most worthy object of ambition, and the educated gentleman is he who is familiar with Greek and Latin literature. The first point emphasized is the choice of a teacher who must be well bred, and, of course, a scholar. Corporal punishment should not be employed, but rather emulation and rivalry, for which purpose boys should be paired off. From the beginning perfect enunciation must be insisted on. Grammar should be taught by practical examples and drill, and should include prosody and rhythm. Greek and Latin should be taught side by side. It is interesting to compare the arguments employed for the study of Greek with those now employed by the extremist for the retention of classics. While great stress is laid on rhetoric and style, Guarino does not exclude broad reading for content, especially in history and geography; but the aim of these studies, as of philosophy and ethics, is to illuminate the references which occur in the readings. As compared with the later Ciceronian movement, the statement may be noticed that "distinction of style is the fruit of a far wider field of study" than the *Letters* of Cicero. Other valuable suggestions are the keeping of commonplace books (*q.v.*) and of reading aloud as an aid to clear enunciation and memory. Lastly, there is the testimony that from his father's Academy "proceeded the greater number of those scholars who have carried learning not merely throughout Italy, but far beyond her borders."

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WOODWARD, W. H. *Vittorino da Feltre and other Humanist Educators.* (Cambridge, 1905.)

GUARINO DEI GUARINI, DA VERONA, or VERONESE (1374–1460). — One of the early humanist scholars and teachers. He studied in turn at Padua, Venice, and Florence.

From 1403 to 1408 he was in Constantinople as a *famulus* in the house of Chrysoloras, the famous Greek teacher, and studied mainly under the son of Chrysoloras. On his return he opened a school at Florence, where he met with success; but in 1414 he moved to Venice, where he taught Vittorino (*q.v.*) Greek and entered into a lifelong friendship with him. In 1418 he was called to Verona as professor of rhetoric, and in 1429 came the invitation from Niccolo d'Este of Ferrara to act as tutor to his son, Leonello. He was permitted, as Vittorino was, to take additional pupils, day students and boarders. The presence of Guarino attracted many distinguished scholars from all parts of Europe to Ferrara, so that in 1436 the municipality appointed Guarino civic professor of rhetoric, and in 1442 obtained the rights to establish a university. Guarino continued his studies until the end of his long life. He was an eager collector of manuscripts, and on his return from Constantinople he brought back some fifty Greek Mss., and later he collected or had transcribed numerous Latin Mss. Among his writings were an elementary Latin grammar (*Regulæ Guarini*), which was widely used, and many translations, including an abridgement of Chrysoloras' *Erotemata*, and parts of Lucian, Isocrates, Plutarch (fifteen of the *Lives* and περὶ παίδων ἀγωγῆς), and the whole of Strabo. As a schoolmaster his aim was avowedly eloquence and scholarship (*vir bonus peritus dicendi*). He divided the studies into three stages: (1) elementary, including reading Italian, Latin, and grammar; (2) grammatical, including formal grammar, and reading of the classics for content and style, Greek and Latin being taught side by side; and (3) rhetorical, consisting mainly of Cicero and Quintilian for style and composition. Guarino's educational ideals are set forth in a letter to his pupil Leonello d'Este and in the *De Ordine Docendi et Studendi* by his son Battista Guarino (*q.v.*).

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Woodward, W. H. *Education during the Renaissance.* (Cambridge, 1906.)

GUATEMALA, EDUCATION IN. — The republic of Gautemala was established Mar. 21, 1847, and the present constitution was adopted in December, 1879, but it has since been repeatedly modified. Under the direction of the president, who is elected for six years, public affairs are administered by the heads of six departments, one of which is charged with public instruction. The population of the state is nearly 2,000,000, about 60 per cent being pure Indians, and the larger proportion of the remainder half castes. In the country at large, the population of pure European ancestry is very small, but in the capital, Guatemala la Nueva, they form about five sixths of the total (125,000, in 1906). The prevailing religion is Roman Catholic, but complete religious liberty is guaranteed.

Public elementary schools are free, and parents are obliged by law to secure the instruction of their children, but with choice between public and private agencies. Public schools are under government inspection, and are maintained partly by local funds and partly by appropriations from the general treasury. In 1909 there were 1330 elementary schools, with 51,820 pupils, an increase over the corresponding totals for 1907 of 68 schools and 7580 pupils. The 1330 schools reported in 1909 include 174 attended by both boys and girls, thirty-one night schools, and four practical schools for boys and three for girls. In the latter schools training for trades or industries is combined with ordinary subjects and with special instruction in morals and hygiene. The Minister of Public Instruction, in his latest report (1909) dwells upon the admirable results of this class of schools, which promise, he believes, rapid increase in numbers.

In addition to the elementary schools, there is a national secondary school for boys, *Instituto Nacional Central de Varones*, a corresponding school for girls with a normal department, and a national normal school for men with a secondary department, all at the capital. At Quezaltenango there is a secondary school for boys, and at Chiquimula one secondary school with a normal department for young men, and a normal school for young women. In 1909 1202 students (758 boys and 444 girls) were enrolled in these secondary and normal institutions. The number of students in the normal school and in normal departments included in the foregoing total was seventy-one. In addition to the public schools and institutes, the chief cities are well supplied with private schools.

Higher education is represented by a school of law with 49 students in 1909, and a school of medicine and pharmacy with 135 students (94 medicine; 41, pharmacy). The school of engineering was temporarily suspended pending the erection of new buildings for the military school, of which it will hereafter be a part. There are also at the capital a national school of handicraft for women, a national conservatory of music, and a school of art. The national library contains about 20,000 volumes.

The public appropriation for education in 1909 amounted to 2,526,015 pesos ($885,146), which was a little less than 7 per cent of the total appropriation for all purposes. A. T. S.

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GUERNSEY, ELIZABETH, COLLEGE. — See Grammar Schools, English; College, English; Public Schools.

GUIANA, EDUCATION IN. — British Guiana, with a population of 304,000 in 1909, had 223 public schools, attended by 33,888 pupils. These schools were supported in part by local funds and in part by government grant, amounting in the year named to £25,274 ($116,370). The wealthy residents of Georgetown, the capital, and the owners of the rich sugar estates employ private tutors for their children or send them to private schools.

Dutch Guiana has a population of about 81,000 exclusive of negroes, and in 1909 reported twenty-three public schools with 2580 pupils and thirty-seven private schools with 4993 pupils. There are also boarding schools maintained by the religious denominations, Roman Catholic, Moravian, etc. A. T. S.

GUIANA, FRENCH. — See French Colonies, Education in.

GUIDANCE, LABOR. — See Vocational Guidance.

GUIDANCE, VOCATIONAL. — See Vocational Guidance.

GUILDS AND EDUCATION — See Gilds and Education.

GUILFORD COLLEGE, GUILFORD, N.C. — A coeducational institution founded in 1837 by the North Carolina Yearly Meeting of Friends as the New Garden Boarding School, and re-chartered in 1888. Preparatory and collegiate departments are maintained. The entrance requirements to the freshman class are equivalent to about twelve points of high school work. Degrees of A.B. and B.S. are conferred. The faculty consists of fourteen members.

GUILFORD, NATHAN (1786–1854). — Lawyer and legislator, active in the establishment of the common school system in Ohio; was graduated from Yale College in 1812. He was for a few years principal of a classical school at Worcester, Mass., and then engaged in the practice of law in Ohio. As a member of the Ohio legislature he was active in the enactment of the first general school law (1821). From 1818 to 1825 he published *Solomon Thrifty's Almanac,* the forerunner of such publications in the United States, extensively used between 1825 and 1850 for the spread of doctrines of common school education. Guilford's almanac contained the calendar, the "weather" predictions, astronomical changes, advice to farmers, and on every page something about the value of education and the need of common schools in Ohio. He was also the author of an arithmetic and a spelling book. W. S. M.

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GUINEA, FRENCH. — See French Colonies, Education in.

GUIZOT, FRANÇOIS PIERRE GUILLAUME (1787–1874). — French historian, man of letters, orator, and statesman, and member of many French academies. He was minister of public instruction from 1832 to 1837, except for brief intervals in 1834 and 1836. Under his ministry the whole scheme of primary instruction was entirely reorganized; higher primary schools were established; the departmental normal schools were put upon an entirely new basis with more effective control by the central authorities; the office of primary inspector was created; and a fresh and lasting impetus was given to the cause of popular education. His circulars to prefects, rectors, inspectors, and teachers form a veritable treatise on education. These were still further reënforced through the columns of the *Manuel général de l'instruction primaire,* which he established with the view of keeping the teachers in touch with the newer educational methods. Among the better known of his historical works are: *Histoire générale de la civilisation en Europe depuis la chute de l'empire romain jusqu'à la révolution française* (1828); *Histoire générale de la civilisation en France depuis la chute de l'empire romain* (1830); *Histoire de la révolution d'Angleterre.* F. E. F.

See France, Education in.

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Witt, Mme. de (Guizot's daughter). *Monsieur Guizot dans sa Famille et avec ses Amis.* (Paris, 1880; tr. London, 1880.)

GUMMERE, JOHN (1784–1845). — A leader in secondary education among the members of the Society of Friends; was principal of Friends' schools in New Jersey and Pennsylvania for forty years. He was at the head of the school at Haverford, which later became Haverford College (*q.v.*); he was active in the American Philosophical Society (*q.v.*), and was the author of works on *Surveying* (1814) and *Astronomy* (1822). His brother, Samuel R. Gummere (1789–1866), was principal of a school for girls at Burlington, N.J. (1821–1837), and the author of a *Geography* (1817), *Spelling Book* (1831), and work on *Elocution* (1857). W. S. M.

See Friends, Educational Influence of Society of.

Reference: —

Allison, W. J. *Memorial of the life of John Gummere.* (Burlington, N.J., 1845.)

GURNEY, M. — See Women, Education of.

GUSTATORY SENSATIONS. — Sensations derived through the organs of taste. There are four qualities of such sensations; namely, bitter, sweet, sour, and saline. To these four qualities are sometimes added two others, which are, however, of doubtful character, namely, metallic and alkaline. Different parts of the tongue have different susceptibilities to these qualities. Thus the tip of the tongue receives sweet tastes more easily than others, while the back of the tongue is more sensitive to bitter. C. H. J.

GUSTAVUS ADOLPHUS COLLEGE, ST. PETER, MINN. — See Lutheran Church, Educational System of, in United States.

GUTHRIE, THOMAS (1803-1873). — Scotch preacher and philanthropist, born at Brechin. At the age of twelve he entered Edinburgh University, where he studied for ten years, first taking a general course, then theology and medicine. This he followed up by study at the Sorbonne in Paris, where he took up natural philosophy, chemistry, and anatomy. He was ordained in 1830, and very soon came into prominence as an influential preacher. When located in Edinburgh, he devoted himself to social work and established savings banks, Sunday schools, and education. His work in the last field gives him a place of importance in the history of British education. Guthrie disclaims the title of founder of Ragged Schools (*q.v.*) in Scotland, giving the credit to the Sheriff of Aberdeen, Mr. Watson. However that may be, it is certain that by his writings Guthrie did more than any other man to spread the idea of the Ragged Schools (*Pleas for Ragged Schools*, 1847–1849). His work among the poor had opened his eyes to the fact that while the provision made in poorhouses, hospitals, asylums, and free schools reached a large majority of the population of Edinburgh, nothing was done for the very lowest classes — the shiftless, drunken, immoral beings who drove their young children on the streets to beg and steal. For the adults Guthrie was not so very much concerned, except that he strongly advocated a limitation on the facilities for obtaining drink; but the young must be taken in hand, for prevention is better than cure. These children needed food and clothing first and education afterwards; hence the need of special schools, or Ragged Schools, to deal with them. These schools were to find food and shelter, to bring back tbe poor waifs by sound religious education, and to fit them for some vocation by industrial training. Such a system would not add to national expenditure, but would reduce the cost of maintaining police, courts, magistrates, jails, and penal settlements. The "Original Ragged Schools" were established in Edinburgh in 1847, and spread rapidly to other Scotch towns, and in his *Third Plea* (1860) Guthrie was able to report the disappearance of juvenile beggars and a decrease in juvenile crime, and to point to respectable mothers and fathers who had been reclaimed by the Ragged Schools. No better testimony to the affection in which Guthrie was held can be pointed to than the remark made by a girl at his funeral, "He was all the father I ever knew." Guthrie edited the *Sunday Magazine* from 1854 to his death, and contributed frequently to *Good Words.*

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GUTS MUTHS, JOHANN CHRISTOPHER FRIEDRICH (1759-1839). — Physical educator; was born at Quedlinburg and obtained his early education in that town, studied theology, mathematics, physics, history, and modern languages at the University of Halle for three years, became private tutor in the family of a physician, and in 1785 accompanied two sons of the latter to Salzmann's school at Schnepfenthal, where he remained in active service as a teacher until a short time before his death. Guts Muths took charge of the boys daily and led them in foot races, vaulting, jumping across a ditch, jumping for height, forced marches, throwing at a mark, estimating with the eye the distance from one place to another, walking on the thin edge of a plank, lifting with a staff a weight moved nearer or farther from the hands according to one's strength, skating, swimming, sliding, etc.

He kept accurate records of each boy's progress from week to week. To the most diligent and proficient boys he taught riding on horseback, and the use of firearms. He also paid much attention to matters of diet, clothing, personal cleanliness, and ventilation of sleeping and study rooms. He encouraged walking, work in the garden, and other outdoor activities. Guts Muths exerted a powerful influence on the development of physical education, by his fifty years of teaching and by his writings on the subject.

His two most important books are: *Gymnastik für die Jugend, enthaltend eine praktische Anweisung zu Leibesübungen. Ein Beytrag zur nöthigsten Verbesserung der körperlichen Erziehung. Spiele zur Übung und Erholung des Körpers und Geistes, für die Jugend, ihre Erzieher und alle Freunde unschuldiger Jugendfreuden. Gesammelt und praktisch bearbeitet von Guts Muths, Erzieher zu Schnepfenthal* (1796). These two books passed through several editions, and have been translated in many languages. They were the first modern manuals on the subjects of gymnastics and play.

G. L. M.

For the influence of Guts Muths on the development of gymnastics, see Gymnastics, German.

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GUYAU, JEAN MARIE (1854–1888). — Poet, philosopher, and sociologist, who in a short life of thirty-three years made some valuable contributions to knowledge. When only nineteen he was crowned by the Académie des Sciences Morales et Politiques for his work, *Mémoire sur la Morale utilitaire depuis Epicure jusqu'à l'École Anglaise* (1874). Until his health broke down completely he taught philosophy in the Lycée Condorcet. In his many philosophical works he emphasized the practical and the social as the best standards of criticism. Philosophical problems should accordingly be stated in terms of society. It is from this point of view that his chief pedagogical work, *Éducation et Héredité* (1887) was written. "Man being made to live among men," he writes, "we cannot go too far in the process of moulding the child for social life." The title of this work is somewhat misleading, for very little attention is given to heredity beyond a brief inquiry into the instinctive equipment of the child on which the educational process may be built up. Guyau offers some sound criticism of the French system of examinations, and gives a comparative sketch of secondary education in England, France, and Germany, and also draws illustrations from American practice for the training of initiative. He accepts the definition of education as harmonious development, and discusses the place of physical, moral, civic, and intellectual education. On instruction he says "teaching must never be a matter of memory, erudition, or pure knowledge, but rather of intellectual, moral, and civic training." In the earlier part of his book he devotes some attention to suggestion as a method of training in right habits. The work on the whole is a valuable appendix to Spencer's *Education.* Guyau also wrote a series of textbooks for use in elementary schools for children from five to eleven, dealing with moral instruction: *l'Année enfantine, l'Année Préparatoire; la première Année de Lecture Courante* (*Éducation, Instruction, Civisme,* one volume for pupils and one for teachers). Two readers on the basis of the reading-writing method were also written by him (*Méthode Guyau; La Lecture facilitée par l'Écriture*). Among his philosophical works may be mentioned *La Morale anglaise contemporaine; l'Irreligion de l'Avenir; l'Art au point du Vue sociologique.* His best known poetical work is the *Vers d'un Philosophe.*

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GUYOT, ARNOLD HENRY (1807–1884). — Geographer, born at Neufchatel, Switzerland, on Sept. 28, 1807. He was educated at the College of Neufchatel and the University of Berlin. He was for ten years professor of physical geography in the college at Neufchatel, and came to America in 1848. For six years he was employed by the Massachusetts State Board of Education as lecturer on geography in the state normal schools at Westfield, Framingham, Bridgewater, and Salem. He was professor of physical geography at Princeton University from 1854 to 1884. He was greatly influenced by Karl Ritter during his studies in Germany, and he brought to America the first rudiments of geography as a science. The textbooks of Guyot were the first to present the study of geography as a science to the English-speaking world. His works include *Earth and Man* (1849), *Geographical Teaching* (1866), geography textbooks for elementary and secondary schools, and many maps and charts. W. S. M.

See Geography, Teaching of.

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GUYOT, THOMAS. — See Port Royalists.

GYMNASIUM. — Originally applied to the exercise ground or public training school maintained, as for example, at Athens, not only for the ephebi, but for all men of military age, this term by a process of transference came to be used in the sense now usually attached to it, *i.e.* an institution for higher education. (See Greek Education, under the caption Educational Practice.) Though the gymnasium was free, the teachers and trainers in gymnastics were paid, and as the poorer citizens had to earn their own living, the Athenian gymnasium, like the modern university, came to be chiefly frequented by the well-to-do. There being plenty of leisure between the exercises, and the spectacles attractive, the gymnasia tended to become fashionable lounges, in which the leisured class spent a large portion of its time. The older men naturally became spectators and critics rather than active performers. Among them developed the walking and talking clubs, which were the origin of Greek schools. Here the Sophists met and discussed the laws.

of nature and of art, and practiced intellectual as well as physical culture. In the suburban gymnasium, called the Academy (ἀκαδήμεια) after the local deity or hero Academus, the sophist Plato started his discussion forum, or courses of free lectures, which, when at his death he devised his neighboring house and garden to his pupil, Speusippos, developed into an endowed University College. Hence our modern Academies (*q.v.*). In another gymnasium, the Lyceum, Aristotle, one of Plato's pupils, established his lectures, open to the inner circle only in the morning, and to the public in the afternoon. Hence the French *lycée*. The term "gymnasium" itself apparently is first used as equivalent for school only in a Greek epigram of uncertain but probably late date in the literally exact phrase "the schools of the Academy" and the metaphorical phrase "in the school of Homer" (ἐν Ὁμηρείῳ γυμνασίῳ).

In Latin the term is not used simply as equivalent to "school"; but as the locally correct term in such phrases in Cicero as "all the gymnasiums and schools of the philosophers." The Romans despised gymnasia. Until the time of Nero there were none in Rome. In the Middle Ages, the gymnasium, both thing and term, was unknown; except to one or two exceptionally learned writers, such as Matthew Paris, who described the school kept by Lanfranc at Bec as a gymnasium. But with the Renaissance the passion for Greek made the name reappear. Knighton describes a Lollard conventicle as a gymnasium, *i.e.* school, of heresy. The coming of Manuel Chrysoloras (*q.v.*) to teach Greek at Florence in 1396 and at Pavia in 1400, and the consequent passion for the study of Greek made Greek terms fashionable. Hence already in a letter written in 1422 Guarino of Verona uses "gymnasium" as the equivalent of "school," and speaks of Cicero as flying with the highest glory through all the schools of Italy (*gymnasia Italorum*). Vittorino da Feltre (*q.v.*) called his school the *Gymnasium Palatinum* or Palace School. This school became the model for many, and so *Ginnasio* became the common term in Italy for a public school of the humanist type. It is possible that the prominence given in this school to physical culture, games and sports being cultivated almost as much as in our modern public schools and universities, may have partly suggested and justified the use of the term "gymnasium." From Italy the term was transported into Germany, and seems to have been first used of the great Netherlands schools, which, alike in the numbers attending, the age to which the pupils stayed, and the subjects of instruction, were almost as much universities as schools, *e.g.* the schools connected with the Brethren of the Common Life (*q.v.*), Emmerich, 1474, and Deventer under Hegius and Lüttich or Liège in 1498. These schools became the model for the great Reformation gymnasium founded, or rather reconstituted by John Sturm (*q.v.*) at Strassburg under the control of the Town Council in 1538. It was probably the fame of this school that finally stamped the term "gymnasium" on the German language as the technical term for the great high schools in which the classics formed and still form the main subjects of instruction.

In England the term "gymnasium" never became popular. It was occasionally used by way of grandiloquence, and schoolmasters were sometimes absurdly termed *gymnasiarcha*, especially in epitaphs, just as in the new cathedral schools of Henry VIII they are termed *archididascalus* and *hypodidascalus* (which one learned antiquary translated into "master of the horse"). One learned person who died master at Fotheringhay, having been second master at Eton, whence he fled from the Roman wrath of Mary, even went so far as to describe himself on his tombstone as *paidotriba*, the term applied to the gymnasium official who rubbed the youth down with oil. But as a rule the common-sense Englishman stuck to the simple and ancient "grammar school" (*q.v.*). A. F. L.

GYMNASIUM. — The equipment of a modern educational institution is not complete without a gymnasium. The provision of a special place devoted to the physical education of youth is not an innovation of modern times, for gymnasia occupied a very important place in Greek education (*q.v.*) and it is interesting to note that the use of the term in the scholastic sense has been retained in Germany, while the French *lycée* recalls the Lyceum, the gymnasium where Socrates and Aristotle met their disciples.

"Gymnasium" as a term in modern English education dates only from the introduction of physical training under cover into English schools. Probably the earliest building used as a general gymnasium in England was the hall for physical training, furnished with giant's strides, parallel bars, leaping horses, ladder, ropes, and the like, known as Mohammed's Gymnasium, established at Brighton about 1848. To this the numerous preparatory schools which then flourished abundantly in Brighton resorted for an hour twice a week or so. In Germany in 1870 gymnasiums were recognized by law as an essential part of the equipment of public secondary schools. But in England physical culture had for more than a century at all events, and perhaps for longer, been developed by games, such as cricket, football, and hockey. In England though some of the new public schools had gymnasiums, that at Rugby College being built in 1859, and at Marlborough College made out of a covered playground in 1869, they did not reach the old schools, now become a recognized requirement of a well equipped secondary school, till the last decade of the twentieth century. Even now in the great Public Schools and the grammar

schools situate in the country or country towns, with ample playing fields, the gymnasium plays an insignificant part in school life.
A. F. L.

The first gymnasium connected with an educational institution in the United States was that of the Round Hill School, Northampton, Mass., built in 1825. The first college gymnasium was one fitted in a hall of one of the Harvard College buildings in March, 1826. Outdoor gymnasiums were established at Yale in 1826, and at Williams and Amherst and Brown in 1827. The wave of interest in gymnastics which was responsible for the erection of these gymnasiums had passed by 1830 and was not revived until 1860, when Harvard, Yale, and Amherst built new gymnasiums, and were followed by other colleges. Except for a temporary check during the Civil War, the building of gymnasiums has gone on steadily since 1860, and nearly all colleges and secondary schools and many elementary schools are now equipped with them. The size, equipment, and cost of gymnasiums vary over very wide limits according to the size and financial resources of the different institutions. There are several college gymnasiums that have cost more than $200,000.

A typical gymnasium building includes one large hall with suspended running track, smaller rooms for boxing, fencing, wrestling, handball, baseball winter practice, rowing on machines, etc., offices and examination room, locker rooms, bathrooms, and swimming pool. In planning a gymnasium building, the first consideration is the dimensions necessary to accommodate the number of students in the institution when the building is erected and to provide for the probable increase in twenty or twenty-five years. The rectangular form is better than the square for the main hall. A room 40 by 60 feet is the minimum size in which satisfactory work can be done. A gymnasium of this size would be sufficient for an institution with one hundred students. The size should increase approximately 500 square feet for every 100 additional students; thus an institution with 1000 students would need a gymnasium 70 by 100 feet. The height of the ceiling should be at least 22 feet in a gymnasium 40 by 60 feet and increased approximately by one foot for every additional 500 square feet of floor area.

The bottom of the running track should be at least 10 feet from the floor and the surface of the track at least 8 feet wide and curved to facilitate turning corners. The number and size of accessory rooms for special forms of exercise would vary with the number of students to be accommodated. With a small gymnasium 40 by 60 feet, it would be enough to have a baseball cage about 20 by 70 feet, a handball court 15 by 30 feet, and a room about 20 by 30 feet for other purposes. With a gymnasium 70 by 100 feet, a cage 30 by 100 feet, four handball courts, and three or four rooms 20 by 30 feet would furnish adequate equipment. All these rooms should have a height of at least 15 feet. The locker rooms should have an area of approximately four square feet for each locker when lockers are arranged in double tiers. The best modern bathrooms in gymnasium buildings are equipped with shower baths only, each shower having a single mixing valve. The number of showers necessary for one hundred students is about eight and two more showers for each additional one hundred students. The administrative office, director's office, and examination room should be arranged en suite in the central part of the building. The latest college and school gymnasium buildings have a large hall or room, near the entrance, in which the athletic trophies, banners, and team photographs are displayed.

There is no building in the equipment of an educational institution where adequate heating and ventilation and absolute cleanliness are so important as in the gymnasium building. Scientists have demonstrated that a man exercising vigorously vitiates the air about ten times as much in a given time as when sitting at a lecture or recitation. The failure to take this fact into consideration when planning gymnasium buildings is largely responsible for the bad air usually found in gymnasiums. The air should be washed, heated, humidified, and pumped into the gymnasium in sufficient quantity to supply 100 cubic feet a minute for each individual using the room. The installation and operation of heating and ventilating equipments adequate to do this work involves a very large expense, but it is unwise economy to curtail expenses in this direction. The temperature should be maintained at 62 to 64 in rooms devoted to exercise and 72 to 74 in locker rooms and bathrooms. The cleaning of the gymnasium, locker rooms, bathrooms, and other accessories is equally important. Every part of the building should be cleaned daily, the floors washed frequently and the gymnasium mats kept free from dust by the use of vacuum cleaners. With adequate ventilation and absolute cleanliness in a gymnasium building, there is no appreciable difference in the physiological effects of indoor and outdoor exercise.

Gymnasium Equipment. — The selection of a proper equipment for the gymnasium of a school or college should receive the most careful attention. The essential points to be considered are: First, to supply enough apparatus for the largest class to be taught; second, to have all the apparatus so constructed that it may be easily and quickly set up and removed; and third, to distribute the apparatus from the standpoint of practical class management rather than architectural expediency.

A typical equipment for a school or college gymnasium in which the largest classes have sixty students would include the following:

2 vaulting bars, 2 horizontal bars, 2 parallel bars, 2 horses, 2 bucks or vaulting boxes, 2 boms, 2 horizontal ladders, 8 climbing ropes, 30 stall bars, 2 pairs jumping stands, 4 inclined boards, 2 springboards, 2 pairs flying rings, 8 traveling rings, 6 mats, 5 × 10 feet, 4 mats 3 × 8 feet, 1 pair basket ball goals, 2 basket balls, 1 indoor baseball outfit, 6 medicine balls, 10 chest weights, 2 neck machines, 2 rowing machines, 60 pairs dumb bells, 60 pairs Indian clubs, 60 wands, and a piano. The cost of such an equipment would be approximately two thousand dollars.

If the gymnasium is to be used by girls only, the horizontal bars, horses, and parallel bars may be omitted.

The three largest manufacturers of gymnasium equipment are the Narragansett Machine Co., of Providence, R.I.; the A. G. Spalding Co., of Chicopee Falls, Mass.; and Fred Medart of St. Louis, Mo. G. L. M.

See ATHLETICS, EDUCATIONAL; ATHLETIC FIELD; ARCHITECTURE, SCHOOL; BATHS; SWIMMING POOL; VENTILATION AND HEATING.

GYMNASTIC TEACHERS. — See PHYSICAL DIRECTOR.

GYMNASTICS. — The term as used by the Greeks applied to all forms of physical exercise such as calisthenics, running, jumping, wrestling, boxing, dancing, and throwing the javelin and discus. After the long period of neglect of organized physical instruction during the Middle Ages, systematic exercise in various forms found a place in the new schemes of education. The universal and ineradicable impulse of all healthy children to play, and the appreciation on the part of educators of the important function of motor training in education, are responsible for the increasingly large place accorded to physical exercise as an integral part of educational procedure since the days of Vittorino da Feltre (*q.v.*).

The differentiation of the forms of exercise into gymnastics, games, and athletic sports occurred at the end of the eighteenth and the beginning of the nineteenth century. It was during that period that Guts Muths, Jahn, and Spiess (*qq.v.*) developed the German system of gymnastics. Ling (*q.v.*) founded in Sweden the system of gymnastics which bears his name, and athletic sports and games were taken up in the colleges and preparatory schools of Great Britain. There are two main classes of gymnastic exercises: first, calisthenics (*q.v.*), which includes free movements of arms, legs, trunk, etc., exercises with dumb bells, wands, bar bells, Indian clubs, rings, hoops, balls, etc., marching, and dancing. Second, apparatus gymnastics, which includes parallel bars, vaulting and horizontal bars, horse, buck, vaulting box, stall bars, jump stands, ropes, poles, ladders, and many kinds of developing appliances, such as chest weights, and other machines built on the principle of weight and pulley or friction.

The main difference between gymnastics and athletics (*q.v.*) is one of aim. The aim of gymnastics is discipline or training for its effect upon the health, normal development, and general efficiency of the individual. The chief aim of athletics is pleasurable activity for the sake of recreation; in the athletic games of boys and young men we see the highest and fullest expression of the play instinct. While the characteristic aims of gymnastics and athletics are essentially different, some of the most important results of physical training are secured from both forms of activity. This is true especially of the hygienic effects of muscular activity upon the circulation, respiration, digestion, assimilation, and excretion. These effects vary over wide limits according to the kind of exercise selected.

In considering the educative value of gymnastics and athletics the most important principle is, that neither of these activities can serve as a substitute for the other. Each contributes some essential parts of a complete physical education. Gymnastic exercises are largely subjective in character; they serve particularly to stimulate normal physical development, promote good carriage and easy coördination in motion and locomotion. Every gymnastic exercise is given for a definite purpose. The object may be to secure motor coördination, hygienic benefit, or some æsthetic effect. In this respect, gymnastics differs radically from athletic exercises, for in the latter the primary object is always to produce some effect outside of the individual, as hitting a ball, throwing an object as far as possible, or reaching a goal before an opponent. The effect of such exercises upon the individual is always incidental and secondary. Another advantage of gymnastics is, that selection based on scientific principles of anatomy, physiology, and mechanics makes it possible to adapt each exercise to the particular needs of the individual, with a view to producing the effect desired. The educative, hygienic, and æsthetic effects of exercise are susceptible of definite control in gymnastics, but in athletics the effects produced on the individual are indefinite and accidental. The particular effect produced by gymnastics depends partly upon the movements selected, but mostly upon the manner of their execution. The best hygienic effects are produced by adapting the movements to the strength of the individual, bringing into play the large muscles of the trunk and thighs, and accompanying the exercise with music, which adds pleasure to the work. The educative effects are best secured by careful selection and sequence of exercises suited to the state of psycho-motor development of the individual, and by a method of teaching which demands accuracy, precision, and speed in execution. The æsthetic effects of form, carriage and grace of motion and locomotion result from gymnastic dancing and other exercises of the same type. The recreative value of gymnastics depends upon the ability of the teacher to make the work interesting, and in a measure upon the attitude of the student toward the work.

In general, the relative effects secured from gymnastics and athletics are as follows: —

GYMNASTICS

PRIMARY EFFECTS:	SECONDARY EFFECTS
Educative	Organic (vigor)
Hygienic	Recreative
Æsthetic	Psycho-motor
	Moral

ATHLETICS

PRIMARY EFFECTS:	SECONDARY EFFECTS:
Organic (vigor)	Educative
Psycho-motor	Hygienic
Recreative	Æsthetic
Moral	

It is very evident from this table that gymnastics constitutes an essential part of a rational scheme of physical education. The results obtained from gymnastic training vary widely for the same reasons that results vary in all branches of education. Poor teaching and inadequate facilities always produce unsatisfactory results in gymnastics as in any other subject. The need for systematic psychomotor training and vigorous muscular activity for organic development tends to increase as life becomes more complex and specialized. The growing appreciation of the physical basis of human efficiency cannot fail to bring about increased recognition for gymnastics in the school curriculum, more competent teachers, and increased material equipment. G. L. M.

See ATHLETICS, EDUCATIONAL; CALISTHENICS; GREEK EDUCATION; PHYSICAL EDUCATION.

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GYMNASTICS FOR GIRLS. — In all schemes of education, the tendency has been to provide better facilities and a more extensive curriculum for boys than for girls. This has been true particularly in regard to physical training. In Germany, England, and the United States various forms of physical training were provided for boys, while this subject was entirely neglected in schools for girls. Adolf Spiess, the founder of German school gymnastics, was the first to advocate gymnastic training for girls, but the traditional idea that womanly deportment is in contradiction to exercise has hindered the development of physical training for girls. Organic vigor and psycho-motor development are as essential to girls as to boys. The results to be accomplished are the same, but the methods employed must vary because of physiological differences in the two sexes.

The gymnastics best suited to girls include marching, calisthenics without hand apparatus and with wooden dumb bells, wands, bar bells, Indian clubs, rings, hoops, etc.; simple exercises in vaulting and climbing (omitting, in general, all exercises requiring support of the body on the arms for more than an instant); easy exercises in jumping; and dancing. Æsthetic and folk dancing constitute one of the most valuable forms of physical training for girls of all ages. By means of judicious selection and adaptation, it is possible to secure from dancing most of the essential values of exercise, such as organic vigor, psycho-motor training, and recreation. Girls need also the training that comes from participation in athletic sports and team games. The qualities of courage, self-reliance, loyalty, and capacity to coöperate with others and subordinate personal interests to the interests of the team which result from participation in team games and sports are as desirable for girls as for boys. This training is especially valuable to counteract the tendency of some girls to be sensitive, introspective, and live too much on the subjective side of life.

In general, girls under twelve or thirteen years of age can do all except the very strenuous exercises indulged in by boys of the same age. With the onset of puberty, considerable modification of the forms of exercise given to girls is made imperative by the anatomical and physiological changes which occur at that time. The most important modifications necessary are the elimination of exercises requiring the support of the whole body by the shoulder girdle for more than an instant, the restriction of exercises involving jumping to those involving very little jarring of the body, and in general the elimination of violent exercises. The introduction of competitive athletic games in schools and colleges for girls from 1890 to 1900 was accompanied in some places by public contests between teams representing different institutions. This feature of athletics for girls has been abandoned by the leading schools and colleges because it was found to be detrimental to the best interests of education.

G. L. M.

See ATHLETICS, EDUCATIONAL; DANCING; WOMEN, EDUCATION OF; etc.

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GYMNASTICS, GERMAN. — The German system embraces three distinct branches, known as *Volksturnen*, or popular gymnastics; *Schulturnen*, or school gymnastics; and *Militärturnen*, or military gymnastics. The organization of the last two branches is maintained and controlled by the government for strictly educational purposes; the popular gymnastic societies are voluntary associations.

The names of three teachers are identified with the upbuilding of German gymnastics: Guts Muths (*q.v.*), 1759–1839; Jahn (*q.v.*), 1778–1852; and Spiess 1810–1858. Before the period covered by the activities of these men, the only physical training found in German schools was the knightly exercises in riding, fencing, vaulting, and dancing taught in the *Ritterakademien*, and instruction in running, jumping, climbing, balancing, and carrying of heavy weights, given in Basedow's school at Dessau. Salzmann (*q.v.*), who had been an assistant at Dessau, founded the Schnepfenthal school in 1784, and introduced the simple exercises known as the Dessau pentathlon. A year later, Guts Muths entered upon his service as a teacher at Schnepfenthal, and devoted himself to the development of a rational system of gymnastics and games. He published his *Gymnastics for the Young* in 1793, the first German manual of gymnastics; this was followed three years later by a book on plays and games. Guts Muths' aim was distinctly pedagogical; he divided physical exercises into gymnastics, manual training, and youthful plays, and defined gymnastics as " a system of exercises having bodily perfection for their aim." The success of Guts Muths' gymnastics at Schnepfenthal led to their introduction in many private and a few public schools. In 1804 Guts Muths urged upon the Prussian minister, Massow, the importance of introducing physical education into the schools. The minister replied that he proposed to make bodily training an essential part of his plan for national education, but the war with Napoleon prevented the carrying out of these plans.

The particular contribution of *Turnvater* Jahn to the German system of physical education was to make gymnastics popular through the organization of independent associations. In *Die deutsche Turnkunst*, published in 1816, Jahn describes the aims of his system of gymnastics as follows: " The turning system would reëstablish the lost symmetry of human development; would connect a proper bodily training with mere exclusive intellectual cultivation; would supply the proper counteracting influence to the prevailing overrefinement, and would comprehend and influence the whole man by means of a social mode of living for the young. Every turning institution is a place for exercising the bodily powers, a school of industry in manly activity, a place of chivalrous contest, an aid to education, a protection to the health, and a public benefit. It is constantly and interchangeably a place of teaching and of learning. In an unbroken circle follow constantly after each other direction, exemplification, instruction, independent investigation, practice, emulation, and further instruction. Thus the turners do not learn their occupation from hearsay. They have lived in and with their work, investigated it, proved it, and perfected it. It awakens all the dormant powers, and secures a self-confidence and readiness which are never found at a loss."

From 1820 to 1842, Volksturnen was prohibited by the government, gymnasia were closed, and gymnastic instruction was generally neglected in the schools. In 1842 the King gave his sanction to the proposal offered by the ministers of War, the Interior, and Education, that " bodily exercises should be acknowledged formally as a necessary and indispensable integral part of male education, and should be adopted as an agency in the education of the people." Massmann, who had been engaged in teaching gymnastics in Munich since 1827, was in 1843 called to Berlin to aid Eichorn's department in carrying into effect the plan advocated in the King's cabinet order. He had been trained in the methods of Jahn, but not being endowed with sufficient skill or energy to adapt Volksturnen to school needs, his administration, which lasted until 1850, was, on the whole, a failure.

Massmann was succeeded by Adolf Spiess, who has been called the "father of German school gymnastics " and the " founder of gymnastics for girls." He received his first instruction in gymnastics at his father's private school, where the methods of Guts Muths were followed. Later he became acquainted with Jahn and his methods. In 1830, while still a student, Spiess formed a class of boys at Giessen, and taught them " common exercises " (*Gemeinübungen*), or class drill in " standing, walking, running, and jumping." In Jahn's system the members of the class follow their foreturner. In 1833 Spiess became a teacher of history, singing, drawing, and turning in the public schools of Burgdorf, Switzerland. He removed to Basel in 1844 to take charge of the gymnastic instruction in the higher schools of that city, and in 1848 he returned to Germany, having been appointed to a high office in the department of education of the Grand Duchy of Hesse. He was successful in the work of organizing and supervising physical training in boys' and girls' schools throughout that state.

Spiess adopted the method of " class turning," which consists in the simultaneous performance by the whole class, either with or without the use of apparatus, of given exercises at the word of command; this method constitutes one of the fundamental principles in German school gymnastics. Spiess based his theory of bodily training on the laws of anatomy and physiology, and arranged his exercises in compliance with his understanding of those laws. He made use of a great variety of exercises, such as free movements, marching, jumping, climbing, and

Jahn's heavy gymnastics. The free movements were often executed to music. The distinctive contribution of Spiess was to render German gymnastics systematic and scientific, and to adapt them to pedagogical purposes and methods. His principal books were *Lehre der Turnkunst* (Basel, 1840–1846), and *Turnbuch für Schulen* (Basel, 1846–1851).

The progress of gymnastic instruction in German schools was hindered by the lack of competent teachers. In 1851 the Royal Central Gymnastic Institute, with parallel courses of instruction for officers of the army and school teachers, was established in Berlin under the joint control of the ministers of War and Education, and Captain H. Rothstein, of the Prussian army, who had studied Swedish gymnastics in Stockholm, was placed at its head. In 1877 the institute was divided into two separate schools, one for army officers and the other for teachers of gymnastics in schools. Rothstein attempted to introduce Swedish gymnastics in the institute, and banished some of the most popular exercises of German gymnastics. His action led to a bitter controversy, in which prominent teachers, physicians, and professors of the Berlin University opposed him. He was finally defeated, and resigned his position in 1863.

Gymnastics constitutes an integral part of the curriculum in schools of all grades in Germany. Each class has its special time for gymnastics, just as it has special hours for arithmetic and reading. The exercises are carefully adapted to the age and sex of the pupils. The youngest pupils, from six to ten years old, engage in a great variety of simple games, easy free movements, marching, jumping, and climbing exercises, and the easier of the fundamental exercises on the gymnastic apparatus. In free movements and heavy gymnastics the exercises grow more complicated and difficult with the advancing age of the pupil. Walking tours, skating parties, and excursions into the woods are frequently made under the lead of those who teach turning. The gymnastic course for girls comprises the ordinary free gymnastics with or without hand apparatus, skipping ropes, marching, dancing, and balancing exercises; various games of ball, easy jumping, swinging, and climbing, and a few of the simplest exercises on the parallel and horizontal bars.

A description of German gymnastics as a system of physical training would be inadequate without mentioning the extensive development of games and plays, which has taken place in German schools during the last twenty-five years. Practically every school in Germany is equipped with a playground, and nearly all boys' schools have facilities for swimming. Organized and supervised play constitutes an essential part of the present system of physical training.

In the United States the German system of gymnastics has been adopted in many large cities and German teachers appointed to direct the work. This is true of Chicago, Cleveland, Cincinnati, Indianapolis, Minneapolis, St. Louis, Philadelphia, etc. G. L. M.

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GYMNASTICS, HYGIENE OF. — See Physical Training, Hygiene of.

HABIT. — **Use of Term.** — The term "habit" in the various writings on the subject is used in a number of different ways. It is used by some writers to cover all of the organized responses of an organism. Such authors speak of the habits of the bee, of the ant, and of animals generally, meaning thereby the whole repertoire of reflexes, instincts, and habits. With advances in comparative psychology there should come a strict limitation in the use of the term "habit." *Habit should refer only to those motor acquisitions which have been acquired by an organism during its lifetime.* The term "mental habit" is sometimes used to refer to mental organization along any line. James, for example, speaks of perception as a "kind of habit." Such a use of the term should be avoided, since it introduces a vagueness in the expression similar to that now present in the term "memory."

Rise of Consciousness and Rise of Habit Simultaneous. — Movement first appears in an organism in the form of reflexes; somewhat later, as growth processes take place, in the more complex form of instincts. Many of these instincts are not completely adaptive. In most organisms the reflexes and instincts are not numerous enough and complex enough to preserve the life of the organism. In such cases (and probably in no organism are the congenital responses wholly adequate) the instinctive and reflex groups must be supplemented by *habits.* Habits when perfected subserve the same function as reflexes and instincts. Angell and Dewey assume that consciousness arises at the moment reflexes and instincts break down — *i.e.* at the point where habit formation begins. As long as congenital responses are adequate, there is no consciousness; the moment adjustment begins, consciousness appears. Its appearance is an integral part of the formation of every habit. On the other hand, as habits are perfected and approach reflexes (so far as efficiency is concerned), consciousness tends to die away. To speak figuratively, the focus of consciousness throughout life is always directed upon the difficult and new aspects of any adjustment.

Neural Basis of Habit. — The simplest neural mechanism operating in any habit must consist of a receptor, a series of conductors, and an effector. But such a mechanism serves equally well for instincts as for habit. Two fundamental differences, however, appear between the two sets of mechanisms: (1) the " pathways " involved in instinct are inherited, while those in habit are acquired in ontogeny; (2) the series of conductors involved in habit probably always leads through the cortex, both in the early stages of the formation of the habit, and even in the later, perfected stage. In the case of many of the instincts, the neural arcs apparently may lie wholly infra-cortical. In the early stages of habit the cortex as a whole is unquestionably involved. It is a commonly expressed opinion, at least, that as habits become more and more automatic (as conscious oversight or attention becomes less and less necessary) the neural processes become more and more segmental in character — that the seat of neural control (as *e.g.* in the eye-hand or eye-foot reactions) passes to lower nervous centers, *e.g.* to the basal ganglia. The work of Franz has thrown some interesting light upon this question, but it is still an open one. Franz in his early experiments upon cats showed that if they were allowed to establish associations between food and the opening of problem boxes, they lost these associations if the frontal lobes were sectioned, but that they could relearn them. His more recent experiments upon primates confirms this earlier work, and adds the new point that if the association was completely formed there was no loss when the frontal lobes were sectioned. It would look as though the system of integration did change and become more circumscribed so far as the association area in the frontal lobe is concerned, as the habit became more complete. Whether the pathway could be still further shortened, so that the association areas of the cortex need not be involved at all, remains to be decided.

In psychology since Hartley's time (and more recently revived by James) we have spoken as though the nervous system was " modified " so as to respond in a highly special way to a stimulus which did not at first elicit a coördinated response. We have spoken as though an actual pathway was formed between the sense organs and the voluntary muscles; as though the nerve fibers became modified molecularly in such a way as to give passage more easily to an oft-repeated stimulus. Sherrington's conception of transverse membranes situated in the gray matter between the end of one axone and the dendrites of the next neurone (*Synapse*) throughout the pathway, is a more recent conception. These surfaces of separation " might restrain diffusion, bank up osmotic pressure, restrict the movement of ions, accumulate electric charges, support a double electric layer, alter in shape and surface tension with changes in difference of potential, alter in difference of potential with changes of surface tension or in shape, or intervene as a membrane between dilute solutions of electrolytes of different concentration or colloidal suspensions with different signs of charge." In other words, we have at the synapses a mechanism delicate and complex enough to account for the " formation of pathways," reënforcement and inhibition of habits, etc., without supposing that there is any actual change or modification occurring in the neurone itself (the conductor) as the result of repetition of stimulus.

Habits come to preponderate over reflexes and instinctive activity in those organisms born with the least mature nervous systems. Watson and Allen's comparative experiments on the rat and the guinea pig respectively show that the rat with its immature nervous system begins to form habits (10–12 days) much later than the guinea pig (2–3 days), which is born with a relatively mature nervous system, but that the rat can form a greater number of such associations and continue to form them for a much longer time. *Plasticity* is the term used to cover the fact that an animal can *modify* its reflexes and instincts in the direction of habit. In general, the higher we ascend in the scale of animal development, the more plastic the nervous system seems to be, its culmination being in man. Yet this advance in plasticity is not continuous. Even in the rodent group we have great differences in plasticity between the rat and the guinea pig. While the chimpanzee and orang-outang stand next to man, certain other of the primates, baboon, rhesus, etc., are probably not greater in plasticity than the dog. (See PLASTICITY.)

Facilitation and Inhibition. — The subject of facilitation and inhibition in the formation of complex habits is a topic strangely neglected in experimental psychology. We have in Sherrington and in many other neuro-physiological treatises a large amount of data on inhibition and reënforcement of the simpler neural processes. But experimental pedagogy has more or less neglected studies, *i.e.* from the standpoint of facilitation and the reverse, of the simultaneous formation of several habits, the mutual relations existing among groups of habits, etc.

On the neural side we have known for some time (thanks to the work of Exner, Mitchell and Lewis, Lombard, Bowditch and Warren, and more recently, of Sherrington and of Yerkes), that the end effect produced by any given reflex arc is dependent upon the intensity of the stimulus arousing that arc, upon the internal condition of the arc, and upon the number and temporal relations of preceding reflexes and upon the action taking place simultaneously in other reflex groups. A sound conveyed to the ear of a chloralized rabbit increases the amplitude of the reflex movement of the foot induced by the stimulus applied to the foot a moment later. The amplitude of the movement of the knee jerk in man likewise can be diminished or increased by stimulating, *e.g.* some distance receptor at varying intervals before administering the electrical stimulus calling out the reflex. For a careful treatment of the neural processes, see Sherrington, *Integrative Action of the Nervous System*, pp. 175 ff. (reënforcement), 191 ff. (inhibition), 199 ff. (interference), and 36 ff. (summation).

Early Habits: the Acquisition of Motor Control. — Early habits are formed both in the child and in the animal by the trial and error process (*q.v.*). The start of voluntary control may best be seen in the child in its first attempts to grasp objects. There are several stages in the process; first, there must be an objective stimulus which arouses movement. Bright objects, moving objects, those making tones or noises of medium intensity, or those possessing certain pleasing contact value, in the normal child are most likely first to elicit movements. In the second place, if progress toward coördination is to be made, some one of the moving organs of the child must come into tactual motor relations with the object. The rattle which is first seen elicits a number of motor responses. Usually and in the long run the hands, being the most motile organs, are first to touch the object. Touching this object, reflexly leads to grasping; the grasping of the object then leads to new forms of stimulation, *i.e.* auditory and visual (of movement of object). The object is now under control, and adaptation is complete. It is supposed that a strong affective tone, intensely pleasurable in character, appears on the completion of the adaptation — upon the successful effort to control the object. It is supposed further that this affective accompaniment means on the physiological side an increased blood supply for those neuro-muscular processes which have just been active, *i.e.* for the group bringing about the success. Thorndike speaks of this as the " stamping-in process." The failure of any group of muscles to bring success, on the other hand, brings about a loss in tone in those muscles, which results in their discontinuance. In other words, the neuromuscular system bringing success is made prepotent (by some change taking place probably at the synapses).

The second trial of the child or animal shows usually, but not always, a decrease in the number of useless movements and an increased speed in the use of the muscular group which brought success on the first trial. Subsequent growth takes place through the entire elimination of all useless movements. In the perfected form the sensory impulses aroused by the object release immediately the proper motor response.

Such command over the muscular system is finally attained that in adult life operations requiring a long series of muscular acts may be executed without the exercise of continuous voluntary control. The initiation of the first movement in the chain is usually a voluntary process. As James has well shown, this initial movement becomes the stimulus to the second; the first and second to the third, and similarly throughout the series. In other words, the " cue " to the second and succeeding acts finally may come to be kinæsthetic.

Formation of Hierarchies of Habit; Acquisition of Skill. — In the acquisition of any skillful act, as, *e.g.* piano playing, typewriting, sending and receiving the telegraphic code, there are displayed, in addition to the simple sensory-motor coördinations, complex or integrated groups of coördinations, which when studied in detail show an interesting history. W. F. Book describes five separate steps in making a single letter on the typewriter, as follows: (1) getting the copy, (2) actual spelling or thinking of each letter to be made, (3) mentally locating it on the keyboard, (4) getting the proper finger to the key, (5) again pronouncing the letter or initiating the final letter-making movements. These simple habits are short-circuited or abridged by a long, slow process until the mere sight of the letter initiates the movement for depressing the key, *i.e.* the letter association has been formed. Long before the process has become automatized the next higher order of habit has put in its appearance, *i.e.* these simple " letter habits " become integrated into " syllable habits," then into easy " word habits," then into complex word habits, into easy " phrase habits," etc., until finally the expert stage is reached, where the word and phrase habits have become so perfected that the writing is absolutely continuous. In this process of acquiring skill, simple habits are not first mastered and then the next higher order, etc., until the expert stage is reached. All orders of habits " make gains simultaneously, but not equally " (Bryan and Harter, *Psych. Rev.*, Vol. VI, 1899, pp. 346–375). Book compares the development of the different orders of habit to the march of a flock of sheep; the whole flock moves forward, now fast, now slow, but any particular animal may push ahead at this moment and lag behind at the next.

Breathing Places and Plateaus. — The onward movement of the group of habits as a whole is often checked. There are daily fluctuations, due in part to mood, fatigue, and the actual forgetting between one day's practice and the next, especially when new and higher orders of habits are just appearing (see Book on " warming-up process "). In addition to these easily understood fluctuations there are longer and more serious breaks in the process, lasting from six to eight days (Book), and still longer periods called plateaus, occurring at critical stages in the learning process and enduring for a much longer time than the "breathing places" (thirty-three days in one case mentioned by Book). These plateaus (including the "breathing places" under this heading) appear in the work of Bryan and Harter (telegraph sending and receiving), Swift (tossing and catching balls), and Book (typewriting). Bryan and Harter suppose that these plateaus appear when the lower order habits are approaching their maximum of development, but are not sufficiently automatic for use as elements in the higher order habits. For these investigators they are necessary periods of "incubation," where elementary habits are making substantial gains preparatory to their organization into higher order of habits. Book objects to this theory of plateaus on the ground that there is not a sufficient time sequence in the development of the different orders of habits. He separates the breathing places from the plateaus. The breathing places are due to irregular lapses in attention. A bad day's work may dampen the learner's ardor for several days. Plateaus, on the other hand, while not appearing in all of Book's curves, occur, when at all, at critical stages in the learning process. They are, according to Book (*a*) "Resting places in the learner's interest and effort; or (*b*) 'break-down' stages caused by excessive effort wrongly applied."

As a matter of fact, a complete analysis of these breaks in the learning process cannot yet be given. Nearly all of the investigators have chosen habits which are too complex for complete analysis. From the standpoint of neural control, there seems to be no conceivable reason why a learning curve should show fluctuations other than those reflecting the general bodily condition and those due to changes in metabolism.

Transfer of Habit: Cross-Education. — It is apparently firmly established that the exercise of any one muscular organ of the body will improve the bilaterally symmetrical organ. Volkmann found that practicing the left arm in discrimination produced a very marked improvement in the right without any practice in the latter. Similar experiments show that practice upon the dynamometer with either hand will improve the strength of grip in the other (Scripture, Downs, *et al.*). Similarly Davis found that improvement in the quickness of the tapping with the right great toe was accompanied by 151 per cent improvement in the left foot; 100 per cent as much in the right hand and 83 per cent in the left hand. Woodworth has made experiments with similar results upon the accuracy of hitting a dot. Davis's conclusions that the effects of exercise may be transferred to a greater or lesser degree from the parts practiced to other parts of the body, and that the transference is greatest to symmetrical and closely related parts, is firmly established, but the interpretation of the facts is not very clear. The whole question is more or less bound up with that of the effects of training upon memory. (See MEMORY.) Thorndike, with his theory of "identical elements" in memory transfer, attempts with some success to extend his theory to cross education, *e.g.* holding that Woodworth's transfer obtained in striking at a dot with the left hand is due largely to the fact that the practice with the left hand trained the eye, and that this training is largely responsible for the improvement noted in the right (unpracticed) hand. The more recent and thorough work of Ebert and Meumann tends to establish the fact against James, and to some extent against Thorndike as well, that rote memory can be improved by practice. The position that such effects were due to common elements and to common modes of attack, better use of attention, elimination of useless methods of attack, increase of interest in problem, etc., is still a tenable one. It must be said, however, that Ebert and Meumann themselves hold that in addition to these factors there is a training of some common memory capacity.

Automatism and Allied Phenomena. — In hypnosis, in certain functional nervous diseases, and in sleep walking, we meet with automatic reactions of various kinds. They may show themselves in the form of word repetitions, *echolalia*, gesture repetitions, *echopraxia* (in hypnosis, katatonia, etc.), and in stereotypy. Stereotypy may take different forms, *e.g.* we may have a stereotypy of attitude, of movement, or of language (verbigeration). In these cases we often see patients maintaining uncomfortable attitudes for hours; others will walk for long distances, taking alternately three steps forward and two backward; others will repeat phrases or verses indefinitely. Such phenomena belong to the field of psychiatry rather than to that of psychology and education. In normal individuals such phenomena are occasionally met in fits of abstraction and in sleep.

Social and Pedagogical Implications of Habit. — The ideal training of a human being would give him the ability to react adequately and rapidly and with a minimum of fatigue to any individual or social situation. In our complex civilization, which is ever changing in its point of stress, which is ever presenting new problems, an organism must automatize as many adjustments as possible, and as easily and as rapidly as possible in order to leave the mind free to meet the point of stress. The early formation of right personal habits has been insisted upon in all writings upon habits. Probably the necessity of forming habits which are not immediately utilizable has not been sufficiently insisted upon. During adolescence there is, especially if there is a bad inheritance, a period when many new and strange demands are made upon the nervous system. At times it breaks down under the strain. Good personal habits — those relating to temperance, control of the sex impulses, the right use of money, respect due to other members of society, etc., serve oftentimes to carry the individual with poor inheritance safely over the periods of conflict. Often when this faulty inheritance is present it is augmented by carelessness in the formation of the early habits (in paranoia, *e.g.* we find carelessness in the use of money, extravagances, etc., in many forms starting very early in life. The implication is that such tendencies might be checked if noted early enough). Much has been and is still being done in the case of functional nervous diseases by the process of reëducation. In regard to the second point, — forcing the youth to form habits not immediately utilizable,—possibly enough has not been said. Normal development in certain cases ceases after a fixed low level of efficiency has been attained. Such subjects either have to be carried through life by other members of society, or else they must be trained to take a more modest but independent place in life. Manual training for the male and similar training for the female in household work, sewing, millinery, etc., is of the utmost necessity. Even though normal development continues, these habits in times of financial reverses are of the utmost advantage to their possessors. J. B. W.

See Acquired Characteristics.

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HABITUATION. — See Habit.

HACKETT, HORATIO BALCH (1808–1875). — Philologist and college professor; was graduated from Amherst College in 1830 and from the Theological Seminary at Andover in 1834. He subsequently studied at Halle and Berlin in Germany. He was tutor at Amherst College and professor at Brown University and the Newton Theological Seminary. He published a *Chaldee Grammar* (1845), a *Hebrew Grammar* (1847), a *Hebrew Reader* (1847), and numerous works on Biblical literature.

W. S. M.

HACKLEY, CHARLES WILLIAM (1809–1861). — College professor and textbook author; was graduated from the United States Military Academy at West Point in 1829, and was instructor there for three years (1829–1832). He was professor in New York University (1835–1838), president of Jefferson College, Miss. (1838–1843), and professor in Columbia University (1843–1861). His publications include *Treatise on Algebra* (1846), *Elementary Course in Geometry* (1847), *Elements of Trigonometry* (1850), and several works on scientific subjects. W. S. M.

HACKNEY COLLEGE. — See London, University of.

HADLEY, JAMES (1821–1872). — Textbook author and college professor; was educated at Fairfield Academy and graduated at Yale College in 1842. He was many years professor of Greek at Yale, and was the author of a widely used series of Greek texts.

W. S. M.

HAGAR, DANIEL BARNARD (1820–1896). — Normal school principal; was born at Newton, Mass., on Apr. 22, 1820. He was educated in the public schools of Newton and graduated at Union College in 1843. He was for several years principal of academies in New York, and later was principal of the high school at Jamaica Plain, Mass. From 1865 to 1896 he was principal of the State Normal School at Salem, Mass. He issued the call for the organization of the National Teachers' Association (*q.v.*); was one of the organizers of the Massachusetts Teachers' Association, and for some years one of the editors of the *Massachusetts Teacher*. He also wrote numerous papers on normal school education.

W. S. M.

HAILEYBURY COLLEGE. — See Grammar Schools, English; College, English; Public Schools.

HAITI, EDUCATION IN. — The Republic of Haiti occupies the western part of the island of Haiti, the second in size of the West Indies. The original inhabitants were practically exterminated in contests with the Spanish invaders, who eventually gained peaceful possession of a depopulated island. It was repeopled by African slaves, first imported in 1517. The Spaniards gradually deserted the island for the more attractive regions of the American continent. French and English adventurers formed a settlement on the northern shore, which was recognized as a department of France in 1714, to which country that portion of the island had been ceded by the Treaty of Ryswick, 1697. The uprising of the negroes in 1791, the heroic leadership of Toussaint l'Ouverture, and the final surrender of the island to France, in 1795, are memorable episodes in its early history. After a long period of struggle and uncertain destinies, the Dominican Republic was proclaimed in 1824, and in 1858 the Republic of Haiti was established. This division of the island covers an area of about 10,200 square miles and has a present population estimated at 2,029,000, of whom nine tenths are negroes and the remainder, save two or three hundred Europeans, are mulattoes.

For purposes of local administration the republic is divided into five departments, comprising eighty-six communes. The people are Roman Catholics, and society retains the distinctions of the old régime in France, the upper class possessing wealth and refinement, in striking contrast with the ignorant masses. The leaders of the republic have professed great regard for education, and their public utterances on this subject reflect the theories and sentiments of the leaders of the French Revolution; but with few exceptions, among whom should be named in particular President Fabre Geffrard, they have been theorists merely, or prevented by repeated revolutions from giving effect to their purposes.

Public instruction was represented in the government of the new republic by a cabinet officer, and the country was divided into fourteen districts, to each of which was assigned a government inspector of schools and higher institutions. In 1860, or two years after the republic was proclaimed, a law was passed providing that public instruction should be gratuitous, and the establishment of primary schools obligatory upon local authorities. Through the efforts of the Minister of Public Instruction, M. Elie Dubois, schools were established in the principal cities, and they have been maintained to the present day. In the country districts very little progress has been made, the fitful endeavors in this direction having been constantly interrupted by political commotions. At present there are about 480 public primary schools, of which number 275 (122 for boys, 153 for girls) are in the cities. The total includes 39 schools for boys in charge of Christian Brothers (*q.v.*); and more than 50 schools for girls in charge of sisterhoods. Schools established by the teaching orders of the Church are adopted as public schools and receive appropriations from the public treasury. In fact, to the teaching orders must be credited nearly all the progress in education thus far realized in the island.

The influence of French precedents is seen in the establishment of schools in which training for the industrial arts is combined with general education. The earliest institution of this sort in Haiti was the *Maison Centrale*, created in 1849 during the imperial rule of Soulouque, whose adventurous career reached its climax in 1846, when he was acclaimed Emperor under the title of Faustin I. The *Maison Centrale*, or School of Arts and Trades, is a government institution, occupying a commodious site at Port-au-Prince, and having accommodation for 150 boarding pupils. The course of instruction includes academic studies, technical branches, religion, music, and military tactics. The school is equipped with fourteen workshops for wood and metal work, blacksmithing, carriage manufacture, etc., but still needs provision for some of the pressing demands of Haiti in industry. A second technical school, *École libre professionnelle*, was established at Port-au-Prince under private auspices in 1892, but through lack of financial support was soon discontinued. There are two orphanages for girls, one at Port-au-Prince and the other at Cayes, both managed by sisterhoods, but subventioned by the government. The former and more important of the two, the *Orphelinat de la Madeleine*, was founded Feb. 18, 1893, by the Mother Superior, Eustochie, of the sisters of St. Joseph of Cluny. The institution receives an annual grant from the State of 444 gourdes ($429). The instruction includes, besides the elementary branches, housekeeping and household arts, sewing and cutting, embroidery, lace making, etc.

For the secondary education of boys there are in the six principal cities public lycées which follow official programs. A commission appointed in 1893 to advise as to desirable modification in the plan of study recommended changes in favor of modern subjects, especially the scientific studies that prepare for the medical profession and for the technical arts. There are a number of business colleges for young men and several excellent secondary schools in charge of the teaching orders; also a college supported by the Wesleyan mission.

Higher education is represented by a national school of medicine and pharmacy, a school of maternity, and a school of law, all at Port-au-Prince, and by private schools of law in other cities, which receive grants from the public treasury. The national school of applied sciences at Port-au-Prince is equipped with a bacteriological laboratory at which important investigations are conducted. The fine arts are promoted by the national school of drawing and painting, also at the capital.

A select number of youths are sent every year by the government to study in Europe or in the United States; but while opportunities are thus provided for an élite circle, the low state of the masses is recognized and deplored. An earnest effort at reform was begun in 1910 by the passage of a compulsory education law with penalties for its violation; but subsequent revolutions have prevented further progress in respect to general education, and have interrupted plans for developing technical education, more especially as related to agriculture. The annual budget for public instruction is about 4,000,000 francs ($800,000). A. T. S.

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HAKLUYT, RICHARD (?1552–1616).— The great historian of Elizabethan travels, under the title of the *Principal Navigations, Voyages, Traffiques and Discoveries of the English Nation . . . within the compass of these 1600 yeares* (published 1589); was educated at Westminster School, where Honter's *Cosmographia* was taught. In 1570 Hakluyt was chosen student of Christ Church, Oxford, and took his M.A. in 1577, and became a preacher. In the Epistle Dedicatory of his *Principal Navigations* he narrates how his cousin Richard Hakluyt in his chambers at the Middle Temple had instructed him in certain books of Cosmography, with a universal map, pointing with his wand to all the known seas, gulfs, bays, straits, capes, rivers, empires, etc., and giving him full geographical information about them. When he went to Christ Church, he continued these studies, reading whatever he could find extant in the Greek, Latin, Italian, Spanish, Portuguese, French, and English languages. " In my public lectures," he says, " I was the first that produced and shewed both the old imperfectly composed and the new lately reformed Maps, Globes, Spheres, and other instruments of this art for demonstration in the common schools, to the singular pleasure and general contentment of my auditory." On Apr. 1, 1584, Hakluyt wrote a letter to Sir Francis Walsingham, directing the foundation of a lectureship in mathematics and another on the art of Navigation in London in or about Ratcliffe, at a yearly stipend of £50 each. He cites the case of the mathematics lectureship secured at Paris by Peter Ramus (*q.v.*). Though Hakluyt was not successful in getting a lectureship in navigation established, the teaching of the subject in mathematical schools (principally private) in the seventeenth century became a settled practice. F. W.

See GEOGRAPHY.

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HALDEMANN, SAMUEL STEHMAN (1812–1880).—Naturalist and author; was born at Locust Grove, Pa., and was educated in a classical school at Harrisburg, at Dickinson College, and at the University of Pennsylvania. He was for many years professor in Delaware College and at the University of Pennsylvania. He was one of the founders of the American Philosophical Association and the American Association for the Advancement of Science (*q.v.*). He wrote numerous works on agriculture, chemistry, and natural history, and the following school books, *Elements of Latin Pronunciation* (1851), *Analytic Orthography* (1860), *Outlines of Etymology* (1877), and *Word-building* (1880). W. S. M.

HALE, BENJAMIN (1797–1869).—Third president of Hobart College (*q.v.*); was graduated from Bowdoin College in 1818 and the Andover Theological Seminary in 1822. He was tutor at Bowdoin (1823–1827), professor at Dartmouth College (1827–1835), and president of Hobart College (1836–1858). He was the author of *Introduction to Principles of Carpentry* (1827), and of several religious books. W. S. M.

See HOBART COLLEGE.

HALES, ALEXANDER OF (d. 1245).— The first great schoolman, exercising a powerful influence over his successors, who made the thirteenth century the golden age of Scholasticism. He was born and educated at Hales in England, and became a Franciscan friar. He was one of the most famous professors at the University of Paris, and won for himself the titles of *Doctor Irrefragibilis, Doctor Doctorum, Theologorum Monarchia*, and *Fons Vitæ.* Bonaventure was one of his pupils, and Thomas Aquinas and Duns Scotus were profoundly influenced by him. Writing just after the recovery of the works of Aristotle, he was the first to bring the Aristotelian ethics and philosophy to bear upon the Christian system. While his psychology was Aristotelian in its general trend, it followed the traditional Augustinian views of the soul and its faculties. His most important contribution to philosophy was the development of the scholastic method (*q.v.*) and its application to the discussion of theological problems. This method, which controlled the thought of several succeeding generations, and is still dominant in Roman Catholic theology, was fully developed in his vast *Summa Theologiæ*, which was written at the request of Pope Innocent IV and printed at Nuremberg in 1482, and served as the model for the great summists of the next generation. His chief contributions to Theology were the doctrines of the Treasury of Merits and the Indelibility of the Sacraments, which have ever since held so prominent a place in the teaching and practice of the Roman Catholic Church. W. R.

See Franciscans; Scholasticism.

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HALF-DAY SESSIONS. — See Holidays, School; Sessions, Length of School.

HALF-TIME PUPIL. — See England, Education in; Examinations; Sessions, Length of School.

HALF-TIME SYSTEM, PART TIME SCHOOL ATTENDANCE. — See Sessions, Length of School; Holidays, School.

HALIFAX, MARQUIS OF. — See Savile, George.

HALL or HOSTEL (Aula, Hospitium, Pædagogium). — Originally a house (or even a single room) tenanted by a group of university students in common. In some cases these would perhaps be boarders with a master; we find early university statutes directed against masters canvassing on the one hand for pupils among the freshmen, and, on the other hand, outbidding each other for houses. In other instances the principal was originally one of the scholars, or even a townsman, who made himself responsible for the rent, etc. In any case the halls were at first startlingly democratic; principals were elected and statutes were framed by the consent of all the students; and this custom influenced the earliest colleges, which were in fact only endowed *hospitia*. An instance of the transition between a hall and a college may be seen in the foundation of St.-Honoré at Paris. This was "a certain house, to be furnished with thirteen beds for the use of poor scholars" under the wardenship of one of the Canons of the Church of St.-Honoré, who was however to be removed if the students showed just cause of complaint against his rule. (Denifle, *Chart. Univ. Par.* l. 68.) The earlier colleges were in fact generally styled "House" or "Hall," a fact which may best be illustrated by enumerating the first twelve Cambridge endowments in order of their foundation. These are Peterhouse (1284), Michaelhouse (1324), Clare Hall (1326), King's Hall (1337), Pembroke Hall (1347), Gonville Hall (1348), Trinity Hall (1350), Corpus Christi College (1352), King's College (1441), Queen's College (1448), St. Catharine's Hall (1475), Jesus College (1496). The great foundation of Trinity (1546) absorbed two older colleges (Michaelhouse and King's Hall) and seven hostels, of which one (Garret Hostel) retains its name to the present day. Dr. Rashdall has traced the steps by which the halls passed from simple lodging houses into officially recognized and controlled communities. University control may be said to have begun with the thirteenth-century legislation which enacted that a house once tenanted by students might thenceforth be let to no outsider so long as there were still students to hire it. Then (about the beginning of the fifteenth century) the authorities attempted to enforce residence in colleges or halls upon all but the richest and poorest students; and, at the same time, to enforce stricter rules within these buildings. The principalships were restricted to masters, and in many other ways collegiate reacted upon aularian discipline; yet these reforms worked so slowly that at Paris, as late as 1486–1487, "certain women kept halls and colleges," as in later times the Dames' Houses flourished at Eton. We must therefore look upon the original meaning of "Hall" as a rather elastic term. Among Cambridge colleges, Clare and St. Catharine's kept the title until quite recent times; Trinity Hall keeps it still to avoid confusion with Trinity College. At Oxford, not only the title, but the thing still survives in St. Edmund's Hall, endowed as early as 1260, but never formally incorporated, and existing since 1557 in partial dependence upon Queen's College; others were merged into colleges during the nineteenth century. A few modern halls have been founded both at Oxford and at Cambridge for certain groups of non-collegiate students, mostly on a denominational religious basis. The term "hostel system" has been applied in modern times to the more economical arrangements in force at the recent foundations of Keble College, Oxford, and Selwyn College, Cambridge, where the students have all meals in common, and in other ways conform more closely to the collectivist economy of medieval halls and colleges. G. G. C.

See Dormitories; Universities; Student Life.

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HALL, ARETHUSA (1802–1880). — Leader in the movement for the higher education of women; privately educated. She was principal of academies at Greenland, N.H., and Haverhill, Mass. (1826–1849). At the latter academy she was the instructor of the poet John G. Whittier. She was also engaged in secondary school work at the Brooklyn Female Academy (now Packer Institute) and the Brooklyn Heights Seminary (1849–1860). She wrote *Manual of Morals* (1849), *Literary Reader* (1850), and papers on the higher education of women. W. S. M.

See Women, Education of.

HALL, BAYARD RUST (1798–1869). — Educational writer and principal of secondary schools; was graduated from Union College in 1820 and Princeton Theological Seminary in 1823. He was president of the College of Indiana (which subsequently became Indiana University) at Bloomington from 1823 to 1831, and principal of academies in New York, Pennsylvania, and New Jersey from 1831 to 1846. His educational publications include a *Latin Grammar* (1828), *The New Purchase* (a satire on the higher educational institutions in the Middle West, 1843), *Teaching a Science* (1848), and *The Teacher Taught* (1852). W. S. M.

HALL, JOHN (1627–1656). — An English scholar; wrote at the age of twenty-two years, *An Humble Motion to the Parliament of England concerning the Advancement of Learning and Reformation in the Universities.* He was educated at Durham School and studied at St. John's College, Cambridge. He removed to London in 1647, and entered at Gray's Inn. The *Humble Motion* contains a vigorous onslaught on the university studies and teaching of the time, written, as the title shows, under the inspiration of Bacon's writings. He complains of the abuse of the endowments of the university. The revenues might be devoted to the establishment of more professorships and fewer fellowships. He says, speaking of Cambridge, that there are only professorships for the three principal faculties, and "these but lazily read, and are carelessly followed." He complains that no chemistry is studied, an early reference to the subject by this name. He deprecates the lack of "quick or dead anatomics, or ocular demonstration of herbs." Nor is there any "manual demonstration of mathematical theorems or instruments." He suggests "a calculation and amendment of the epochs of time." He suggests that the needed reformation of the universities can be brought about by reducing the "friar-like" list of fellowships, so that it only includes working fellows of different kinds. Money thus saved could be applied to experiments and inventions, etc. Improving on Humphrey Gilbert (*q.v.*) he suggests that two (instead of one) new books could go to the public library, and that copies of foreign books sold in England should also be required. Antiquities, *e.g.* medals, statues, ancient rings, etc., taken from confiscated estates, should go to the public museums, and foreign scholars should be honored. Like Comenius, he is an advocate of realistic instruction in the school. In short, his University demands are: the further development of mathematics, the determined investigation of natural science and cataloguing of results, and the drawing up of a synopsis of medicine. Hall is said to have had a pension from the Commonwealth authorities equivalent to £350 a year of present money, and Thomas Hobbes the philosopher said of him: "No man had ever done so great things at his age." F. W.

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Beginnings of the Teaching of Modern Subjects in England. (London, 1909.)

HALL, SAMUEL READ (1795–1877). — One of the earliest organizers of American institutions for the training of teachers; was born at Croydon, N.H., on Oct. 27, 1795. He was educated in the district schools and at Kimball Academy, Meriden, N.H. For ten years he was a teacher in the district schools; and in 1823 he organized a seminary for the training of teachers at Concord, Vt. The seminary was later moved to Andover, Mass., and subsequently to Plymouth, N.H. During the seventeen years (1823–1840) that Mr. Hall conducted his teachers' seminaries, the first of their kind in the United States, he was active in agitating the cause of professional education. His *Lectures on School-Keeping* (1829) and his *Lectures on Female Education* (1832) were important contributions to the scientific study of education during the early period. Hall was one of the founders of the American Institute of Instruction (*q.v.*), and he is reported to have made the first use of blackboards (*q.v.*) in the United States. The late Henry Barnard is authority for the statement that Hall used blackboards in the district schools that he taught prior to 1815, and extensive use was made of blackboards in the teachers' seminaries that he conducted between 1823 and 1840. Besides the two educational books already referred to, Hall was the author of numerous textbooks, including *The Child's Assistant* (1827), *Geography for Children* (1832), *School History of the United States* (1832), and *School Arithmetic* (1836). W. S. M.

See EDUCATION, ACADEMIC STUDY OF.

HALL, THOMAS (1610–1665). — Minister and schoolmaster — a pedagogical follower of John Brinsley (*q.v.*). He was educated at the King's School, Worcester, where Henry Bright was schoolmaster; from 1624 to 1629 he was at Oxford. He returned to Worcestershire and taught a "private school at the Chapels belonging to King's Norton." He became curate of King's Norton and master of the free grammar school at the same place. In his school work, some persons of quality sent their sons "to table (board) in the house with him," and many of his scholars proved able ministers. He contributed to the library of the Free School at Birmingham, and at King's Norton he gave his study of books, on condition that the parish built a library house for them.

The classical school textbooks written by Hall are: (1) *Wisdom's Conquest — or An Explanation and Grammatical Translation of the*

13th book of Ovid's Metamorphosis (1651); (2) *Phaeton's Folly or the downfall of Pride: Being a Translation of the 2nd Book of Ovid's Metamorphosis, paraphrastically and Grammatically* (together with Flowers, Phrases, Rhetoric, Etymologies) (1655).

Hall further wrote the *Vindiciæ Literarum, the Schools Guarded* (1654), in which he attacked the position of the Anabaptists, who argued according to Hall that the arts and sciences are "idols, anti-christian, the smoke of the bottomless pit, filth, froth, dung, needless and useless for the right understanding of the Scripture. The Spirit alone was sufficient without the human help of learning." Hall therefore undertakes to prove the excellency and usefulness of arts, sciences, languages, and history and all sorts of human learning in subordination to divinity and preparation for the ministry. Hall's defense of learning is cast in logical form. It is followed by *Centuria Sacra*, a hundred rules for expounding the Scriptures and a Scriptural rhetoric, containing a compendium of all the most material tropes and figures in the Scriptures. In the same volume is contained the *Histriomastix*, or a whip for Webster — an examination of John Webster's (*q.v.*) *Examen of Academies*, which Hall calls "delusive," and claims to show the sophistry of Webster's "new-found light," which Hall thinks tends to the subversion of universities, philosophers, physicians, magistrates, ministers. Hall also wrote books on the *Loathsomeness of Long Hair*, 1654, and the *Downfall of May-Games*, 1660. F. W.

HALLE. — See FRANCKE, AUGUST HERMANN; GERMANY, EDUCATION IN, under Universities; THOMASIUS, CHRISTIAN; WOLFF, CHRISTIAN.

HALLE, THE ROYAL FREDERICK UNIVERSITY OF. — This institution was established in 1694, the University of Wittenberg (*q.v.*), established in 1502, being incorporated with it in 1817; this explains the official title, *Vereinigte Friedrichs-Universität Halle-Wittenberg*. The plan of founding a seat of higher learning at Halle goes back to the Elector Frederick III of Brandenburg, who was desirous of maintaining a university for the newly acquired duchies of Halberstadt and Magdeburg, thereby removing the existing dependence upon the nearby Saxon university of Leipzig; he was furthermore anxious to possess another Lutheran citadel of learning besides the somewhat remotely situated University of Königsberg. The celebrated jurist Thomasius (*q.v.*), whose advanced ideas had led to his dismissal by the conservative University of Leipzig, transferred his activities to the city of Halle in the late eighties of the seventeenth century, and was followed a few years later by the theologian, August Hermann Francke (*q.v.*), who had been forced to leave the same institution. The imperial sanction for the establishment of a regular university was not secured, however, until 1693 (Oct. 19), the formal opening taking place on July 12 of the following year. From the beginning an institution of four faculties was planned, the theological faculty representing more liberal Lutheran tendencies than prevailed at Wittenberg and at Leipzig. Indeed, the entire spirit of the new institution was *modern*, in consequence of which it has been styled by Paulsen the first modern university. Thomasius had evoked considerable opposition at Leipzig not only by announcing, but actually delivering his lectures in the German language; at Halle he was free to do as he chose, and as a result of his example German gradually displaced Latin as the vehicle of expression in university lectures. The theological faculty was for many years the most important of the university, pietistic tendencies prevailing, and during the third and fourth decades of the last century was the most renowned in Germany. The medical faculty did not attain importance until the beginning of the nineteenth century, several clinics having been established at the end of the previous century, at which time the natural sciences were still included in this faculty. The faculty of philosophy had secured wide renown at the beginning of the eighteenth century, largely through the influence of Christian Wolff, professor of mathematics and philosophy, who was dismissed for his radical applications of philosophy to theology by King Frederick William I of Prussia, but reinstated by Frederick the Great; and again at the close of the century through Friedrich August Wolf, the philologist, who organized a philological seminar in 1787, and who was largely instrumental in divorcing this discipline from theology, upon which it had been dependent. Another prominent name connected with this faculty is that of the philosopher Eduard Erdmann, whose connection with Halle covered a span of sixty years (1836–1896). In the course of the nineteenth century various scientific institutes (physical, chemical, biological, etc.) were established, and in 1863 the best equipped agricultural institute in Germany was organized as an integral part of the university, being included under the faculty of philosophy. The political science seminar (1872) contains an excellent collection of statistical material, and has been publishing a valuable series of contributions since 1877. The library is housed in a modern building (1882), and contains about 250,000 volumes and almost 1000 manuscripts. Connected with the University Library is the Hungarian National Library, founded in Wittenberg in 1725, and containing over 100 manuscripts and over 4000 volumes of Hungariana and old Wittenberg theological literature. The university also possesses an archæological museum, containing a numismatic collection and a collection of engravings. The annual budget amounts to approximately half a million dollars. During the first half of the eighteenth century Halle attracted more students than any other German university with the single exception of Jena, but toward the end of the century it was passed by Leipzig, although it had grown larger than Jena in the meantime. During the winter semester of 1911–1912 its 3112 students were distributed as follows: Theology 378, law 389, medicine 356, philosophy 1572, auditors 233, more than half of the total number of matriculated students being enrolled in the faculty of philosophy. The teaching staff consists of about 100 professors and 60 docents.

R. T., Jr.

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HALLUCINATION. — A perception that does not originate from a stimulus from the world external to the body. There is no psychological distinction between hallucinations, illusion (*q.v.*), and perceptions (*q.v.*), for all are interpretations of sensory data. The distinction is sometimes made that perceptions have a sensory basis, and the interpretations from the sensory data are like those of most people, that illusions are wrong interpretations of sensory stimuli, while hallucinations have no external object corresponding to the stimulus, and that the interpretations of the mental sensory data are necessarily erroneous. The normal perceptions and illusions may therefore be called exogenous in origin, and the hallucinations are endogenous. This differentiation, however, will not hold in all cases, and there is no such sharp dividing line between perceptions, illusions, and hallucinations as is indicated by this definition. That hallucinations are abnormal, that perceptions are normal, and that illusions may be partly normal and partly abnormal is another distinction that has been drawn, but this is only partly true. Hallucinations are found to a great extent in abnormal people, but they are of almost constant occurrence in normal individuals in a certain form (in the condition of dreaming).

The qualitative characteristics of hallucinations are the same as those of perceptions. They have the subjective element of reality, they have color, form, depth, tone, and emotional effect. All these qualities are similar to those in perception of so-called normal character. We may say, therefore, that an hallucination is a perception most often due to the activity of the central nervous apparatus without the intervention of the peripheral organs, and commonly found in abnormal mental conditions.

All kinds of hallucinations may be present at the same time, *e.g.* that of an animal (visual), moving (visuo-motor), of horrible color (visual), giving forth obnoxious fumes (olfactory), that of poison (organic?), and bellowing loudly (auditory); that of being transported through the air (organic), of having wings grow (skin and organic), of seeing (visual) and talking (auditory and motor) with angels.

The most typical condition in which hallucinations are found is that of delirium, in which condition the hallucinations are sometimes the only abnormal phenomena. All toxic states in their acute forms are accompanied by hallucinations, and the diagnosis is sometimes made, other information being lacking, from the character of these perceptions. In dementia precox hallucinations are common, and they lead to the abnormal impulsive actions so characteristic of this form of mental disease. In epilepsy, the auras may be considered as hallucinations, and the confusional states following an epileptic attack are often made up of hallucinations of hearing, sight, and the organic senses. In mania, hallucinations are occasionally met with, and in paranoia they form the foundation on which the subsequent structure of delusions of persecution and ideas of grandeur is built.

The presence of hallucinations usually indicates a grave condition, although it must be remembered that the accumulation of cerumen in the ear, the presence of a catarrh or of polypi in the nose, decayed teeth, and injuries to or disease of the eye may lead to the formation of hallucinations of the appropriate sensory character. The hallucinations of peripheral origin are usually of a vague type, but if unattended to they may lead to central, *i.e.* cerebral, disturbances and become definite. It is generally believed that constant stimulation eventually leads to lack of attention to the sensation, but this is not always true, for we find that the constant buzzing sounds from ear affections often lead to an exaggeration of the mental character of the sensations, owing to the abnormal degree of attention being given to them, and there may result an elaboration of the sensation into a complex of a fixed character. It is, therefore, of importance that at the first sign of an abnormal sensation (hallucination) a careful examination of the sense organ be made, for the treatment of a bad physiological condition in the early stages will stop the vague hallucination and prevent the formation of a more definite one.

S. I. F.

See Delirium; Dementia Precox; Epilepsy, Intoxication; Paranoia.

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HAMBURG, FREE TOWN OF, EDUCATION IN. — See Germany, Education in.

HAMERTON, PHILIP GILBERT (1834–1894). — English art critic, etcher, and essayist; born near Oldham in Lancashire, where he was educated at school and privately. A great part of his life he spent in France. After devoting himself for some time to painting and sketching without much success, he turned to art criticism and writing, and contributed much to spreading a knowledge of art among the public and in popularizing etchings. His best known work is the *Intellectual Life* (1873), a collection of essays in the form of letters, marked by clear, simple style, if not by a remarkable depth of thought. The thesis which Hamerton sets up is that " intellectual living is not so much an accomplishment as a state or condition of the mind in which it seeks earnestly for the highest and purest truth." In the section of the work which is devoted to education there is an insistence on the *non multa sed multum.* Modern education attempts to cover too many subjects, with the accompanying scattering of interest, lack of mastery, absence of concentration, and pressure. Hence he approves of the old and somewhat restricted curriculum, of few subjects, but thoroughly cultivated, and of a system which would now be called elective, namely the granting of certificates of competence for ability in any subject rather than insisting on a definite course concluding in a university degree. " The only hope for us is to make a selection from the attempts of our too heavily burdened youth, and in those selected studies to emulate in after-life the thoroughness of our forefathers."

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Philip Gilbert Hamerton, Autobiography, 1834–1858, and a Memoir by his Wife, 1858–1894. (London, 1896.)

HAMILTON COLLEGE, CLINTON, N.Y. — An institution which developed out of the Hamilton Oneida Academy, established by Samuel Kirkland, a missionary of great influence among the Oneida Indians, who had been a pupil at Dr. Wheelock's Indian School at Lebanon (see DARTMOUTH COLLEGE). The academy was chartered in 1793, and among its trustees was Alexander Hamilton. John Niles, a Yale graduate, was the first principal when work was begun in 1798. In 1812 it was decided to extend the scope and influence of the institution, and funds were raised for a college through the efforts of Rev. Caleb Alexander; a grant was also obtained from the legislature. Hamilton College was chartered in 1812, and it was proposed to begin with professors of chemistry and mineralogy, surgery, and anatomy, the institutes of medicine, and obstetrics. Nothing became of the suggested medical chairs, however, for some time. The first president was Rev. Dr. Azel Backus, a graduate of Yale (1812–1817). The number of students rose rapidly, and buildings were added at the cost, however, of the reserve fund, so that by 1835 a second permanent fund was established. Under President Simeon North (1839–1857) progress was again very well marked; buildings were improved and added to; and new subjects were introduced, including geology and mineralogy, elocution and rhetoric, law, political economy and history, moral philosophy and religious instruction, French and German. The succeeding presidents have been Dr. Samuel Ware Fisher (1858–1866), Dr. Samuel Gilman Brown (1868–1881), Dr. Henry Darling (1881–1891). Hamilton College has had a number of distinguished scholars on its faculty, and on its roll of alumni are to be found the names of many who have achieved distinction in the Christian ministry and in all fields of public life.

The college is well situated in the midst of beautiful scenery, with a campus of ninety acres, and comprises sixteen buildings used for recitation and other purposes. The entrance requirements are equivalent to fifteen units. Two courses, classical and Latin scientific, are offered, leading to the degrees of A.B., Ph.B., and B.S. The student enrollment in 1911–1912 was 190. Provision is made to receive the students in dormitories and fraternity houses. There is a faculty of twenty members. Melanchthon Woolsey Stryker, D.D., LL.D., is the president.

HAMILTON COLLEGE, LEXINGTON, KY. — An institution for the education of young women, established in 1869. College preparatory, collegiate, music, art, and expression courses are offered. Two years of college work are offered, for which credit is given at the Transylvania University (*q.v.*). There is a faculty of twenty-five members.

HAMILTON, JAMES (1769–1829). — Inventor of a new method of learning languages — the Hamiltonian System. He was born in London, but spent most of his time in Europe as a merchant. He studied French, German, Italian, Latin, and Greek. A reversal of fortune compelled him to resort to teaching languages. His system consisted in putting foreign textbooks with literal interlinear translations into the hands of his pupils and giving them a vocabulary before he taught grammar. He made an experiment in London on a number of poor boys placed under his charge by an English member of Parliament for six months, at the end of which they could translate the Gospel of St. John and Cæsar's *Commentaries.* Hamilton taught languages very successfully (1815–1823) in most of the large Eastern towns in America, as well as Montreal and Quebec. On his return to England he taught in London and many other towns. He was several times attacked as a charlatan and impostor, but although he certainly employed methods of advertising which were not above suspicion, there is no reason to believe that he was not honest. He published many keys, including the Gospels of St. Matthew and St. John in Greek; Gospel of St. John; Æsop's *Fables*, Eutropius, *Phædrus* in Latin; Gospel of St. John, Perrin's *Fables*, in French; Campe's *Robinson Crusoe* in German; Gospel of St. John in Italian. His system he describes in *History, Principles, Practice and Results . . . of the Hamiltonian System* (Manchester, 1829).

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SMITH, SYDNEY. *Essays Social and Political.* (London, n. d.)

HAMILTON, SIR WILLIAM (1788–1856). — A leader in the school of Scottish metaphysics. After some schooling in Scotland and two years in London, Sir William went in 1807 as a Snell exhibitioner to Balliol College, Oxford, where he pursued his studies zealously, though with some independence, devoting himself chiefly to the study of Aristotle and the classics. Graduating with honors in 1810, he became a member of the Scottish bar, and took up his residence in Edinburgh. He was not markedly active or successful in his chosen profession, chiefly because his life was mainly that of a student; he devoted himself to researches of all kinds, unbroken except for occasional excursions into the field of practical politics and social reform. In 1820 he was an unsuccessful candidate for the chair of moral philosophy in the University of Edinburgh, where, however, in 1836, he was appointed to the professorship of logic and metaphysics, a position which he held till his death. Meanwhile, in 1829, his career as a philosophical writer began with the appearance in the *Edinburgh Review* of some articles on *The Philosophy of the Unconditioned.* His edition of the works of Reid appeared in 1846, that of Stewart in 1855.

His philosophy was not systematically developed, but its main points are clear enough. The central point is his view of consciousness, which he analyzed under three aspects: (1) As it is in itself. In this sense consciousness is noumenal and is another name for immediate or intuitive knowledge. (2) As divided into the three groups, cognition, feeling, and conation consciousness is recognition of its own acts and affections. But it is only cognition which has received at his hands adequate treatment. The laws of cognitive activity he has developed with remarkable precision. His doctrine of perception was influenced by both Hume and Kant, and usually teaches that matter is in itself unknown, and that, so far as it is perceived, it is perceived only in its relations to the percipient mind. (3) Consciousness is called conditioned, and assumes the form of common sense. The facts here he classified into truths of perception and truths of reason, both of which are alike inscrutable in their essence and therefore inexplicable. Yet the facts themselves are evident. Hamilton was clearly a realist in his psychological doctrine. He does not develop his doctrine of the will, with which he coupled desire, except in fragmentary discussions of ethical import; and feeling is likewise treated only in some lectures in which he maintains that pleasure is the reflex in consciousness of the spontaneous energy of the soul, pain being the consciousness of restrained exertion. Thus he planted himself on the authority, yet the limited sphere, of human consciousness. In his logic and metaphysics the formal consequences of this standpoint are seen.

Hamilton's chief practical interest was in education, in which he distinguished himself both as a teacher and writer. His lectures in psychology, metaphysics, and logic at the University of Edinburgh were for twenty years (1836–1856) the most powerful factor in the thought of Scotland. They, together with his writings, won him widespread recognition as the most stimulating teacher, the most learned metaphysician, and the profoundest speculative thinker in Great Britain. His contributions to educational literature consist of a series of eight essays originally published in the *Edinburgh Review* during the years 1830–1836. While they have not the universal human interest possessed by those of Spencer, published some twenty-five years later, they attracted general attention, had a decisive practical effect, and contained much of permanent value. Five of them were devoted to the subject of university reform in its various aspects. With great dialectical skill and enormous learning he argued for the restoration of their ancient powers and prerogatives to the universities of Oxford and Cambridge. He contended that these universities had been absorbed by the colleges which had grown up in connection with them and usurped their time-honored functions. In the universities as originally constituted the cycle of instruction was distributed amongst a body of professors, all professedly chosen from merit, and each concentrating his ability upon a single subject. But since the Reformation the academical instruction had been monopolized by the colleges and left in the hands of tutors and fellows, appointed from favoritism, and each undertaking to teach the whole curriculum. This usurpation of the teaching function by the colleges he vigorously attacked as illegal, modern, and destructive of educational efficiency, and advocated the restoration to the universities of their former functions. The reforms which he championed have since been accomplished. The university professoriate has been resuscitated, reorganized, and re-endowed; restrictions have been removed from the fellowships and they have been thrown open to merit; the conduct of examinations and the granting of degrees has been restored to the university authorities; students are now admitted to the universities without becoming connected with any college; and, finally, all religious tests (against which Hamilton argued trenchantly and which prevented the attendance of Dissenters and Roman Catholics) have been abolished by the universities, though not by the colleges.

Hamilton was an ardent humanist. One essay was devoted to the defense of the humanities as the most useful subject of instruction. Another goes at length into the controversy between mathematics and philosophy, as to which is the more useful as a means of mental training. His conclusion is that " no study cultivates a smaller number of the faculties, in a more partial or feeble manner, than mathematics, and therefore they ought not to be made the principal, far less the exclusive, object of academic encouragement." H. D. and W. R.

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MILL, JOHN STUART. *Examination of the Philosophy of Sir William Hamilton.*

VEITCH, J. *Hamilton.* (Edinburgh, 1882.)

HAMLIN, CYRUS (1811–1900). — Missionary, educator, and first president of Robert College; was born at Waterford, Me., in 1811. He was graduated from Bowdoin College in 1834, and three years later from the Bangor Theological Seminary. He went to Turkey as a missionary in 1838. At the close of the Crimean War he secured from Christopher R. Robert, a New York merchant, a gift for the organization of an undenominational Christian college near Constantinople. Robert College was opened in 1860, and Mr. Hamlin was its president until 1876. He was a professor in the Bangor Theological Seminary from 1877 to 1880, and president of Middlebury College from 1880 to 1885. For an account of his educational activities among the Christians, Moslems, and Jews of Turkey, see his *My Life and Times* (Boston, 1883). W. S. M.

See ROBERT COLLEGE.

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GOULD, ELIZABETH P. Robert College. *Education,* September, 1890, Vol. XI, pp. 1–11.

WASHBURN, GEORGE. *Fifty Years in Constantinople and Recollections of Robert College.* (Boston, 1909.)

HAMLINE UNIVERSITY, ST. PAUL, MINN. — A coeducational institution, established in 1854 at Reading, Minn., and after a period of suspension reopened at Hamline in 1880. About one half the contributions to the university have come from members of the Methodist Episcopal Church. There are no college fraternities. The departments include the college of liberal arts, conferring degrees of A.B. and Ph.B., and a preparatory school. There were in 1910–1911 twenty-three members of the instructing staff, and the students numbered 226 in the college of liberal arts, and 25 in the preparatory school. C. G.

HAMMA DIVINITY SCHOOL, SPRINGFIELD, OHIO. — A theological seminary of the Lutheran Church, established in 1850. Degrees are not granted.

HAMMOND, CHARLES (1813–1878). — Academy principal; was educated in the common schools of Connecticut and at Monson Academy and Yale College, graduating at the latter institution in 1839. He subsequently took the course at the Andover Theological Seminary. He was principal of the Monson (Mass.) Academy from 1845 to 1878. His publications include *New England Academies and Secondary Schools* (1867), *History of Groton Academy* (1856), and numerous papers on secondary education. W. S. M.

See ACADEMY IN AMERICA.

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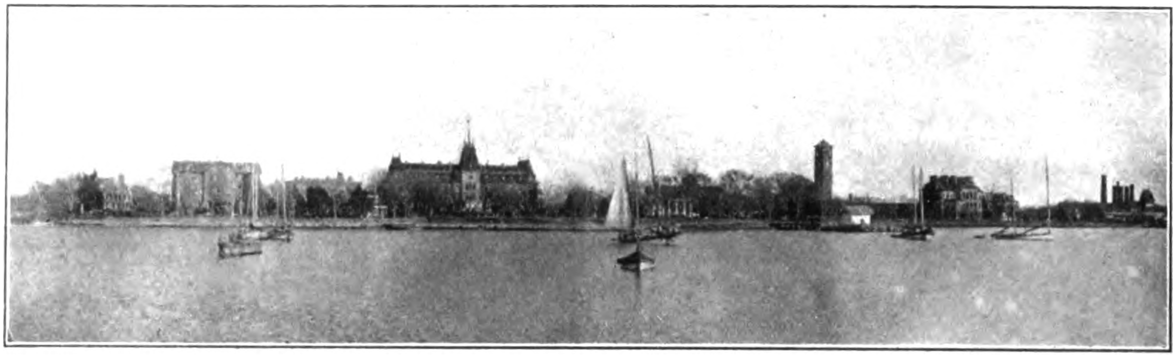
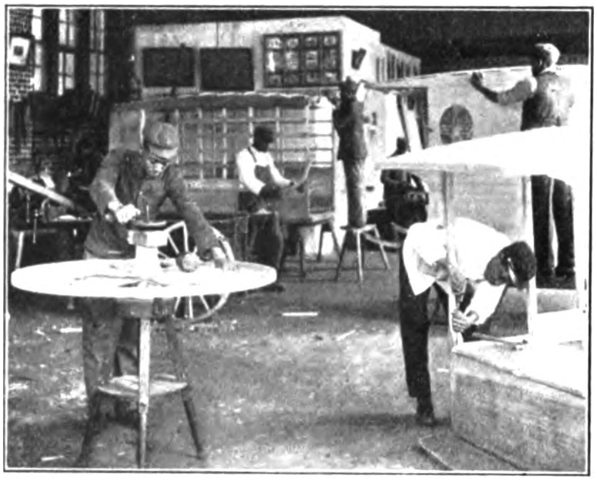
HAMPDEN-SIDNEY COLLEGE. — A small but historic institution, situated in the village of Hampden-Sidney, near Farmville, Va. Its beginning is found in measures taken in 1774, by the Presbyterian Church, to establish a " public seminary " in Prince Edward County. The prospectus of the Hampden-Sidney Academy declared that no sectarian consideration should influence the conduct of the school, a pledge kept throughout its history. The academy was opened on Jan. 1, 1776. The name was a memorial to the English patriots, John Hampden and Algernon Sidney. In May, 1783, a college charter was secured from the General Assembly of Virginia; among the incorporators were Patrick Henry, James Madison, and a number of famous Virginians. The college increased rapidly in the scope of its work, number of students, and endowments up to the Civil War. From 1863 to 1866, inclusive, no students were graduated, all of them enlisting in the Confederate army as soon as they reached the age for service. At this time less than thirty boys remained in college.

The record of the alumni is remarkable. Early students included William Cabell, Governor and judge of the Virginia Court of Appeals; Joseph Carrington Cabell, co-founder with Thomas Jefferson of the University of Virginia; William Cabell Rives, twice minister to France; and representatives of many old Virginia families. From 1787 to 1789 William Henry Harrison was a student. Among the alumni there have been two members of the Cabinet, ten senators, twenty-two members of the House of Representatives, eight governors of states, and four ministers to foreign coun-

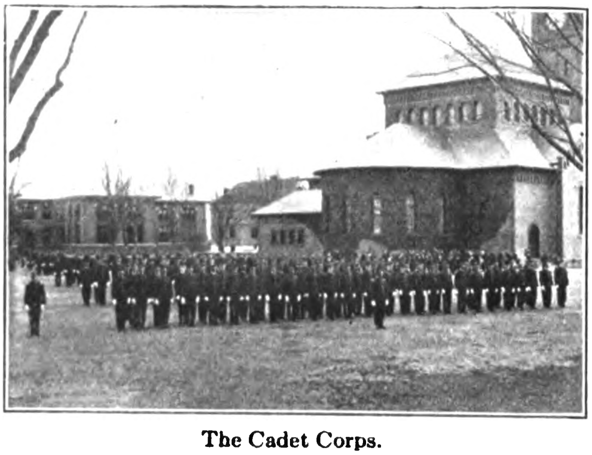


General View from Hampton Roads.

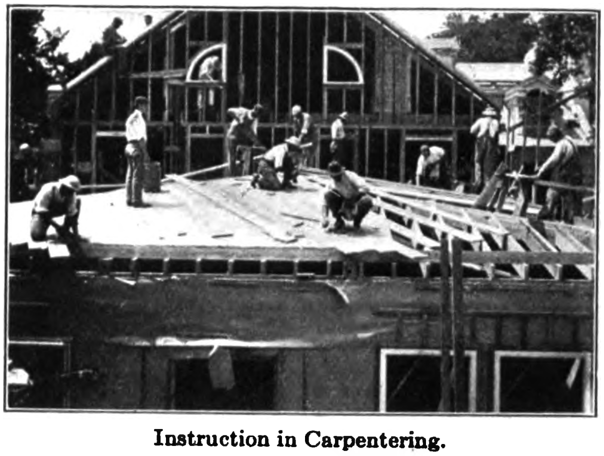


Instruction in Wagon Building.

Instruction on the Hand Loom.



The Cadet Corps.



Instruction in Carpentering.

HAMPTON INSTITUTE.

tries. Alumni also held many important posts in the Confederate States.

The institution maintains a preparatory school and undergraduate courses, conferring the bachelor's degree in arts and letters, admission to which is by examination or certificate from an approved high school. The degree of A.M. is conferred. There were in 1910–1911 eleven professors in the faculty, and 113 students. C. G.

Reference: —

History of Hampden-Sidney College in the biographies of its presidents, 1775–1900, in *National Cyclopedia of American Biography*, Vol. II, pp. 21–27.

HAMPTON NORMAL AND AGRICULTURAL INSTITUTE, HAMPTON, VA. — This school for negroes and Indians was founded by General Samuel Chapman Armstrong (*q.v.*) in 1868 on the shore of Hampton Roads, near Fort Monroe, Va., for the purpose of providing a practical education for the children of the ex-slaves. For two years it was under the control of the American Missionary Association. In 1870, however, it became independent of any association or sect, receiving a charter from the state of Virginia.

Hampton Institute is now an undenominational industrial school, controlled by a board of seventeen trustees. The school property includes 1100 acres of land and 135 buildings, among which are a church, an academic hall, a library, dormitories, and buildings for the teaching of agriculture and the mechanical trades. The number of students (1912) was 1699, of whom 81 were Indians (Indians were first admitted in 1878), 899 are negro boarding pupils, and 457 are negro children in the Whittier day school, which is used as a practice school for the training department. The negro boarding pupils pay for their board and clothing, partly in cash, partly in labor; the Indians are assisted by the government in these payments. But the great majority of students cannot pay their tuition, which is provided by churches, Sunday schools, benevolent societies, and individuals.

Hampton Institute offers elementary and advanced academic and agricultural courses, thirteen trade courses, and courses in business, home economics, library methods, matron's work, and the training of teachers. Its object is to train teachers and industrial leaders for the negro and Indian races. Great stress is laid on character building and on the development of a missionary spirit in the pupils. Besides the regular work on the school grounds, which includes a summer school for teachers, a farmers' conference, and a general negro conference, Hampton Institute carries on extension work of a very varied character, influencing schools and communities in all parts of Virginia and in many other Southern states. More than seven thousand young people have had the benefit of Hampton's ideals and training. They have for the most part gone back to the Western plains or to the Southern states, and there have become centers of influence — teachers, farmers, skilled mechanics, thrifty homemakers — leading their people more by deeds than by words to a higher plane of citizenship. H. B. F.

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Ludlow, H. W. *Twenty-two Years' Work of the Hampton Normal and Agricultural Institute.* (Hampton, Va., 1893.)

HANCOCK, JOHN (1825–1891). — School superintendent; was educated in the district schools of Ohio. He was for four years (1845–1849) a teacher in the common schools of Ohio; principal of schools in Cincinnati, 1850–1864; instructor in a business college, 1864–1866; city superintendent of the schools of Cincinnati, 1867–1874; city superintendent of the schools of Dayton, 1874–1884; city superintendent of Chilicothe, 1885–1888, and state superintendent of public instruction in Ohio, 1888–1891. He was the author of numerous papers on educational subjects. W. S. M.

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HANDBALL. — One of the oldest and most universally played games is that of bouncing a ball against a wall by hitting it with the open hand. From this simple children's game, various difficult and complex games have been developed in different countries. In Ireland the game of handball is played in a rectangular court surrounded by four smooth walls; the ball is caromed around the walls and returned with the hand. In Spanish-American countries the game called pelota (ball) is very similar to handball, only the hand is reënforced by a wooden scoop strapped to the forearm. Another interesting development of the "handball game" is the game of "fives," which it is claimed originated with the boys at Eton and Rugby. The Eton fives court was originally formed by two buttresses of the chapel, the side obstacle, called the "pepper box," being the end of the banister belonging to the chapel steps, and the "hole" merely an accident. The Rugby fives game is slightly different from the Eton game. Both varieties of this game are very popular in the Public Schools of England as well as at Oxford and Cambridge.

In recent years a simple game of handball has been developed in the United States. This new form of the old game is rapidly growing in favor as an indoor game, and is now played in nearly every gymnasium in the country. The rules of this new game vary in different parts of the country, but the essential principles are the same everywhere. In its simplest form the game is played against a smooth surface of brick, cement, or wood, about fifteen to twenty feet wide and twelve to fifteen feet high. The floor in front of the wall is of wood or cement; the court is marked by parallel lines running back from the corners of the walls about twice the width of the walls. A transverse line across the middle of the court serves as a service line. The game is played by two, three, or four players. When there are three players, each player scores for himself when serving, and the other two players play as partners against the server. When played by four players, the game is called "doubles," and the players are divided into sets of partners who score together. The rules of the game are similar to those of lawn tennis. The server stands in the front half of the court, bounces the ball on the floor, and hits it with the open hand against the wall; the ball must land in the back half of the court and be returned by the receiver on the first bounce. The ball is then bounced against the wall and returned either "on the fly" or after one bounce on the floor, in any part of the court, until one player fails to return it or makes it bounce outside of the court. The server continues to serve until he fails to return the ball in the court when he is "out" serving. Each point missed by the receiver counts one point for the server. The game is for twenty-one points. Much interest is added to the game by the presence of a side wall or other obstruction, making possible a greater variety of difficult plays. The game is extremely popular; first, because it is easily learned and yet affords unlimited opportunity for the development of skill; second, because it may be played in any good-sized room with a smooth wall or on smooth ground adjoining a smooth building wall; and third, because all the equipment necessary for the game is a small rubber ball.

Handball is a most valuable form of physical training because it combines most of the advantages of the best athletic games. As a form of exercise it is admirable, for it brings into play all the different groups of muscles; the abdominal organs are stimulated by the bending and twisting movements, and the activity of the heart and lungs is accelerated. The game may be played lightly or vigorously, according to the strength of the players. Handball is also valuable as a means of physical education. It serves to develop agility, judgment, accuracy, and endurance. In addition to these physical and educational values, handball affords wholesome recreation of the kind that is most beneficial to students and teachers. Another valuable characteristic of handball is that it can be played outdoors as well as indoors. There are many handball courts in the yards and on the roofs of college and school gymnasia. G. L. M.

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HANDWORK IN EDUCATION. — See ART IN EDUCATION; also APPRENTICESHIP AND EDUCATION; INDUSTRIAL EDUCATION; MANUAL TRAINING.

HANDWRITING. — See WRITING.

HANNAK, EMANUEL (1841–1899). — Austrian educator, born at Teschen, where he received his school education. In 1859 he entered the University of Vienna, and devoted himself mainly to the study of history. In 1866 he became a teacher in a gymnasium in Vienna, and at the same time private docent in the university. His main interest was in history and the teaching of that subject. In 1870 he gave instruction at the *Pädagogium,* of which Dittes (*q.v.*) had charge, for the further training of teachers. He became greatly interested in pedagogy and the training of teachers. In 1874 he was appointed director of the Normal School at Wiener-Neustadt, and with this in view visited the chief normal schools of Germany. He achieved great success in this position, and through his interest in education and the after training of teachers won the support of residents and teachers. In 1881 he succeeded Dittes as director of the *Pädagogium* in Vienna; his work there attracted attention not only throughout Europe, but also in the United States. In 1889 he became honorary member of the New York Industrial Association, and two years later wrote a monograph on *The Training of Teachers in Austria* for the New York College for the Training of Teachers Educational Monographs (Vol. II, No. 3, pp. 87–112). Besides his other activities, he took a prominent part in promoting the higher education of women, and the first German gymnasium for girls was opened at the *Pädagogium* in 1891. Of his writings the majority deal with the teaching of history and textbooks in history: *Lehrbuch der Geschichte für Mittelschulen, Lehrer- und Lehrerinnenbildungsanstalten*; *Lehrbuch der österreichisch-ungarischen Geschichte* (1884); *Historischer Schulatlas* (1886); *Methodik des Unterrichts in der Geschichte* (1891). In 1889 he issued a new edition of K. Schmidt's *Geschichte der Pädagogik,* to which he contributed the section on education in ancient times. He was a contributor to Rein's *Encyklopädisches Handbuch,* and wrote several reports on the teaching of history for international expositions.

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HANOVER. — See Germany, Education in.

HANOVER COLLEGE, HANOVER, IND. — A coeducational institution, the successor of Hanover Academy, a school opened in a log cabin in 1827, by the Rev. John Finley Crowe, at the request of the Presbytery of Salem, Ind. The first students were sons of the Scotch-Irish Presbyterians who settled in Indiana. On Dec. 30, 1828, the school was incorporated by the legislature of Indiana. The Theological Department, established to meet a condition imposed by the synod, was continued until 1840, when it was removed to New Albany, Ind., and later became the McCormick Theological Seminary (*q.v.*). In 1833 the institution was chartered as Hanover College, and opened on the manual labor (*q.v.*) system, which soon failed. On Feb. 25, 1909, the charter was amended to eliminate denominational control. One trustee is nominated each year by the alumni.

The college maintains, besides the usual undergraduate courses, admission to which is based on entrance requirements of fifteen units, a summer school, a preparatory academy, and graduate courses conferring the degree of M.A. for one year's work in residence. There were in 1911–1912 twenty-one members of the instructing staff, and an enrollment of 260 students. C. G.

HARDENBERGH, JACOB RUTSEN (1736–1790). — First president of Rutgers College; was educated in the academies of New Jersey, and was for several years engaged in the ministry of the Dutch Reformed Church. He was instrumental in the establishment of Queen's (now Rutgers) College, and was its first president (1770–1790). W. S. M.

See Rutgers College.

HARDIN COLLEGE, MEXICO, MO. — An institution for the education of young women, founded in 1873. High school and junior college, music, and art work are given. There is a faculty of twenty-four instructors.

HARKNESS, ALBERT (1822–1907). — Author of Latin textbooks and college professor; was graduated from Brown University in 1842, and subsequently studied in Germany. He was for ten years instructor in secondary schools, and in 1855 he became a professor in Brown University. He was one of the founders of the American Philological Association and of the American School of Classical Studies at Athens (*q.v.*). He was the author of seventeen Latin textbooks. W. S. M.

HARMAR, JOHN (1594–1670). — Classical scholar and schoolmaster; educated at Winchester and Magdalen College, Oxford. He took his B.A. in 1614, and was a master in Magdalen College School, Oxford, in 1617. He became headmaster of St. Albans School in 1626, whence he dates his translation of the *Janua linguarum* of William Bathe or Batæus, a Jesuit of Salamanca (1626). In 1650 he returned to Oxford as professor of Greek. He wrote school textbooks, *Praxis Grammatica*, 1622, and the *Lexicon Etymologicon Græcum*, being an edition of Scapula, with a *Lexicon Etymologicum Linguæ Graecæ*, compiled by Harmar himself in 1637. He is also noteworthy as the translator of the Assembly's *Shorter Catechism* into Greek and Latin, 1659. F. W.

HARMONY, MUSICAL. — See Musical Terms.

HARMONY, HARMONIOUS DEVELOPMENT. — The social philosophy of the later eighteenth century was cosmopolitan, not nationalistic, in tenor. It regarded the divisions of mankind into different political states as arbitrary or artificial, and took Humanity as its ideal object of endeavor. Man was more than the citizen. Consequently the educational systems that had national, or any particularistic political or religious, ends were looked upon with hostility. In opposition to them were urged the superior claims of an education which should develop the individual as a member of humanity. The motto of such an education was the harmonious development of all the faculties of the individual, as against the partial and narrowing tendencies attributed to national and confessional systems of education. The conception of harmony of development was strengthened by the tendency toward "Hellenism" — that is, to regard the Greek personality as the normal expression of human powers. (See Culture.) It was also associated with the popular objective and absolute idealisms of the time, which regarded the individual as universal mind in miniature, and which treated development as the process of actualizing the latent or potential universality. Under this influence the idea of harmony took in some cases (as in that of Froebel) a romantic or even mystical turn, instead of the classic form characteristic of the Hellenic ideal. J. D.

See Development; Froebel; Goethe; Herbart; Lessing; Neo-humanism; Pestalozzi; Romanticism; Voltaire.

HARNISCH, WILHELM (1787–1864). — German educationist of the Pestalozzian school; was born in Wilsnack, near Potsdam, Prussia, attended the gymnasium at Salzwedel, and in 1806 entered the University of Halle. After about half a year his study there was rudely interrupted, as the university was closed by order of Napoleon I. He spent a year in tutoring, and then completed his studies at the University of Frankfort-on-the-Oder. In 1809 he was called as a teacher to a private school in Berlin, which had been founded by Plamann, a direct disciple of Pestalozzi. There he also came in contact with Jahn (*q.v.*), and was inspired by him with a great love of gymnastics. In 1812 Harnisch was appointed as principal of the teachers' seminary at Breslau, which institution he soon made one of the most important centers of Pestalozzian ideas in Germany. When the war of liberation began, he, with all of his students, volunteered to join the army against Napoleon, but the educational authorities refused their consent, as they regarded the work he was doing as too important to be interrupted, even on account of such patriotic motives. Nevertheless, when later on the era of political reaction set in, Harnisch, like so many other patriotic Prussians of his time, was denounced as a demagogue. He had instituted an open-air gymnasium, which had become even more popular than the famous "Turnplatz" of Jahn in the "Hasenheide" near Berlin. It was just this influence of Harnisch over the young men of the country which rendered him suspicious to the government. His "Turnplatz" was closed, and even the natural history excursions which he used to undertake with his pupils were arbitrarily interfered with. In 1822 he was even transferred to the teachers' seminary at Weissenfels, a much inferior institution, which, however, by twenty years of devoted efforts, he raised to the rank of one of the best training schools in Prussia. In 1842 he resigned his position, and lived for the rest of his life as the pastor of a village near Magdeburg.

Not only through his training of teachers, but also through his literary activity, Harnisch was very influential in shaping the character of the German public school. Like Diesterweg (*q.v.*), he emphasized the individuality of the pupil, but he also laid stress on the social factor in education. His contributions to the methodology of arithmetic, geometry, and geography are very important. In geography he introduced into the Prussian schools the method by which the child first studies his home surroundings (*Heimatskunde*), and from them passes on to the study of his country and of the world.

Among his works may be mentioned: *Handbuch für das deutsche Volksschulwesen*, first published in 1812, reëdited by Bartels, Langensalza, 1893; two pedagogical magazines, edited by him, the one (*Der Schulrat an der Oder*) from 1814 to 1820, and the other (*Der Volksschullehrer*) from 1824 to 1828; *Die Weltkunde* (geography), Breslau, 1817, and *Das Weissenfelser Schullehrerseminar und seine Hilfsanstalten* (*The Weissenfels teachers' seminary and its auxiliary institutions*), Berlin, 1838.

F. M.

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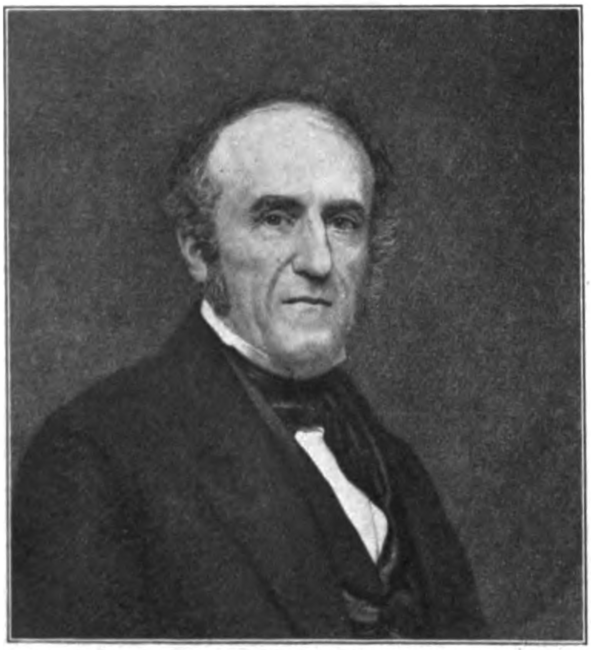
HARPEDONAPTÆ. — The philosopher Democritus (*q.v.*) is reported as having said, in his usual boastful fashion, that no one had as yet surpassed him as a geometrician, "not even the so-called Harpedonaptæ of Egypt." These were probably the recognized teachers of geometry among the Egyptians, since the fact that Democritus speaks of them as interested "in the construction of plane figures with proof" shows that they were more than simple surveyors. The word means "rope stretchers," and originally referred to the custom of surveyors to stretch a rope around three pegs so as to make a triangle with sides equal to three, four, and five units, respectively. This formed a right triangle, and it enabled the surveyor to run a line at right angles to a given line. The plan is still used by surveyors. It is probable, however, that the word had lost its original meaning, just as geometry (*q.v.*) has long since ceased to be "earth measure," and that the harpedonaptæ were the teachers of geometry of Egypt. This plan of constructing a right triangle by means of rope stretching is a very old one. It is found in China and India as well as in Egypt, and the process is pictured upon the temple at Edfu, the inscription dating from the Ptolemaic period.

D. E. S.

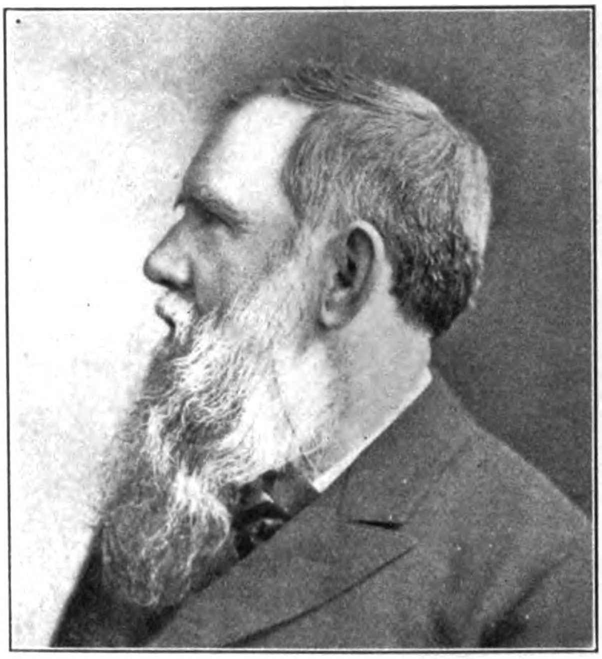
HARPER, WILLIAM RAINEY (1856–1906). — An educator, born at New Concord, Ohio, July 26, 1856; was graduated from Muskingum College in 1870, received the degree of Ph.D. from Yale in 1875; taught in minor academic positions in Tennessee and Ohio, 1875–1880; was professor of Hebrew in the Baptist Theological Seminary, Chicago, 1880–1886; served as principal of the Chautauqua Summer Schools and correspondence courses, 1884–1898; and was professor of Semitic languages in Yale University,. 1886–1891. In 1891 he became head professor of Semitic languages and literature and first president of the University of Chicago. He died in January, 1906. Dr. Harper's experience and training gave him a singularly wide range of interests and sympathies. His graduate work at Yale inspired him with high ideals of productive scholarship; his duties in preparatory schools and the theological seminary revealed and developed remarkable powers as teacher and lecturer; his experiments in organizing correspondence instruction in Hebrew and his summer work at Chautauqua gave him firm faith in popular education; his contact with men and institutions evoked extraordinary capacity for leadership and organization. All these aptitudes and abilities were energized by a tireless will and directed by an original mind. The founding of a new university afforded its first president an unusual opportunity, of which he took full advantage. The characteristic features which he impressed upon the institution were: (*a*) the division of undergraduates into two groups,

Cyrus W. Hamlin (1811–1900). See p. 214.

William T. Harris (1835–1908). See p. 219.



Mark Hopkins (1802–1887). See p. 310.



B. A. Hinsdale. (1837–1900.) See p. 280.

A Group of American Educators.

the Junior College (freshmen and sophomores) and the Senior College (juniors and seniors), — a division based upon the theory that the first two years belong more properly to a six-year secondary school period, while the last two are an introduction to university studies; (*b*) the division of the academic year into four periods of three months each — a plan by which buildings and equipment are in continuous use, and students may be matriculated or graduated quarterly instead of annually; (*c*) the concentration of the student's attention for each quarter upon three, or sometimes four, courses which met four or five hours a week; (*d*) the inclusion as regular divisions of the institution of both university extension lecture courses and correspondence instruction; (*e*) the establishment of a press division as an integral part of the university; (*f*) the outlining of a policy of affiliation by which smaller colleges were through supervision and subsidy to be standardized, and brought into relation with the senior colleges and graduate schools. The General Education Board and the Carnegie Foundation (*qq.v.*) are carrying out on a national scale plans which in many respects Dr. Harper hoped to realize with the University of Chicago as a center. Dr. Harper's published works include textbooks for teaching Hebrew, Greek, and Latin, constructive and critical studies in the Old Testament with especial reference to the priestly element and to prophecy, and volumes of essays and addresses on Biblical, ethical, and educational subjects. G. E. V.

See Chicago, the University of.

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HARRINGTON, HENRY FRANCIS (1814–1888). — School superintendent and textbook writer; was educated in the schools of Boston, at the Phillips Exeter Academy, and graduated at Harvard in 1834. He was teacher and principal of elementary and secondary schools in Massachusetts from 1834 to 1864, and superintendent of schools at New Bedford, Mass., from 1864 to 1888. He was the author of *Graded Spelling Book* (1880), *Harper's Introductory Geography* (1888), and numerous papers on educational subjects. W. S. M.

HARRIS, WILLIAM (1765–1829). — Fifth president of Columbia University; was graduated from Harvard College in 1786. For several years he engaged in the work of the ministry. He was principal of a classical school in New York City from 1802 to 1811, and president of Columbia from 1811 to 1829. He was the author of several historical works. W. S. M

See Columbia University.

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HARRIS, WILLIAM TORREY (1835–1908). — American educator; was born near North Killingly, Conn. After attending rural schools, he completed in New England academies his preparation for college. He entered Yale College, where he remained for more than two years, making an unusually brilliant record. Desiring greater freedom to devote himself to the study of the natural sciences, he withdrew from Yale, and removed to St. Louis, Mo., in 1857, where he remained for twenty-three years, serving first as a tutor in a private family and as a teacher of shorthand; afterwards as a principal of a grammar school; later, from 1866 to 1867, as assistant superintendent of schools, and from 1867 to 1880, as superintendent of schools. In 1880 he severed his connection with the schools of St. Louis, and, after spending some months in European travel, settled in Concord, Mass., becoming one of the founders of the Concord School of Philosophy and Literature (*q.v.*), and engaged in philosophic study and writing. In 1889 he was appointed United States Commissioner of Education by President Harrison, and filled that office until 1906, when he voluntarily retired. The remaining years of his life he spent in congenial study, his last service being connected with the editorship of Webster's *New International Dictionary.*

Philosophical Contributions. — Under the influence of a young German, Brockmeyer, Harris became an earnest student of philosophy and one of the foremost exponents of Hegelianism in the English-speaking world. *Hegel's Logic* is one of the fruits of this influence. On the appearance of Spencer's *First Principles* in 1862, Harris wrote a review, but, unable to find a magazine to accept it, he founded and edited, from 1867 to 1893, the *Journal of Speculative Philosophy*, at the time the most important enterprise in philosophy ever undertaken in America. Considering philosophy as the most practical of all subjects, he soon became accustomed to interpret every question, whether of art, religion, science, politics, or education, in the light of its standards, for, as he said, "the test of any system of philosophy is the account it gives of the institutions of civilization." A thesis composed of passages from Harris's writings, and compiled in 1890 by Marietta Kies, forms the only organized presentation of his work. Although he was not a professor in a college or a university, yet he greatly stimulated the study of philosophy through the *Journal of Speculative Philosophy*, through his labors in the Concord School of Philosophy and Literature, through his educational reports and addresses, and through his personal contact, public and private, with his fellow men.

Contributions to Education. — Harris was America's first great educational philosopher. Because of his protracted, intelligent, and scientific study of the psychology, the history, and the philosophy of education he developed such insight into school problems as was enjoyed by none of his predecessors and by few, if any, of his contemporaries.

His activities and contributions in books and articles, as well as addresses, were extraordinary, whether viewed from the standpoint of quantity or quality or the range of subjects treated. The bibliography of his writings (see references) contains 479 separate titles, which cover all the important questions that have been discussed in the educational world during the last half century. Among his more important writings are to be included his thirteen annual reports of the public schools of St. Louis, which established his reputation as an educational thinker of the first rank; his report as chairman of a subcommittee of the Committee of Fifteen upon the correlation of studies, which was submitted to the National Educational Association, and which constituted an epoch-making contribution to the educational literature of our times; his report as the chairman of a subcommittee of the Committee of Twelve, which considered the problems of instruction and discipline in the rural school; his annual reports as United States Commissioner of Education from 1889 to 1906, which commanded the respect of educators at home and abroad, and by which the Bureau of Education became an educational clearing house for the world; the prefaces and introductions to the volumes of *The International Educational Series*, of which he was the editor; Webster's *New International Dictionary*, of which he was editor-in-chief; and *Psychologic Foundations of Education*, in which he sets forth in its thirty-nine chapters the psychological explanation of the more important educational factors of civilization and its schools.

In his executive work as superintendent of city schools in St. Louis and as Commissioner of Education in Washington, he demonstrated his ability to realize educational ideals born of critical observation and reflection. He was such an administrative and supervisory officer as he himself describes in an article in the *Educational Review* (City School Supervision), Vol. III, 1892, pp. 167–172.

In his contributions to education, he labored continuously to accomplish three great purposes. The first was to psychologize education. Along with other leaders in the school world, he showed the futility of the old-time psychology, with its so-called "faculties of the mind," and demonstrated the worth of the new. His second purpose was to establish faith in the school as an institution having sociological functions and value. In the *Report of the Committee of Fifteen* he discussed four bases for the correlation of studies: (1) the logical order of topics and studies; (2) the symmetrical whole of studies in the world of human learning; (3) psychological symmetry; (4) the pupil's natural and spiritual environment.

His final purpose was to place education upon an enduring foundation. He subjected the whole field to critical analysis, interpreting and justifying the school, and assigning to it its proper place in the scheme of institutional life. His view of the world, in which was embodied the altruistic, missionary idea at the bottom of our civilization, included the notions that education is a process of conscious evolution and that it is the only rational, reliable agency by which man may work out his destiny in harmony with the will of the Divine Being. W. S. S.

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HARRISON, GESSNER (1807–1862). — Author of textbooks and college professor; was graduated from the University of Virginia in 1828. He was professor there from 1828 to 1848, and subsequently established a classical school at Belmont, Va. His publications include *Greek Prepositions* (1848), and *Latin Grammar* (1852). W. S. M.

HARROW SCHOOL. — This school, one of the seven great Public Schools of England included in the Public Schools Act, 1868, was sixth of these in the date of legal foundation, but last in its actual commencement, which took place in 1615; ranked in general estimation as third or second by virtue of its record as a resort of the rich and a producer of statesmen and men otherwise prominent in the world, especially the political world of England. Its development, however, as a great school for the aristocratic and wealthy class is comparatively recent. Unlike Winchester, Eton, and Westminster, which were especially designed as great schools to furnish men to serve in high stations in Church and State, and have done so from their beginnings, Harrow has developed in a way which its founder certainly never contemplated, and which he would possibly have resented. For there can be no doubt, alike from the station of the founder and the statutes which he prescribed, that what he meant to establish was a small local grammar school, chiefly for the poor of a small rural parish, not a great national establishment for the wealthiest of the *nouveaux riches* of the realm. The founder was John Lyon, who lived at Preston, a hamlet in the extensive parish of Harrow in Middlesex, some twelve miles from London then, now a suburb of that ever-extending city. The whole of the property left by him produced only some £138 a year. The foundation of Harrow school, like that of Rugby (*q.v.*) a few years before, is an indication of the growth to independence and moderate wealth of a new middle class on the partial ruin of the great ecclesiastical and secular nobility which took place under Henry VIII. The era of more than princely foundations like those of Wykeham and Wolsey, great soul-purchasing colleges, had given way to the more humble charitable gifts by kindly disposed people of moderate means who had no children of their own for the benefit of the more prolific and less prosperous of their neighbors. Lyon devoted his whole possessions to the school, and that is why the process of foundation took no less than forty-four years. The first step, which on parchment was the foundation of the school, was taken on Feb. 19, 1571, the date of Letters Patent from the Queen. They recited the intention of John Lyon of Preston in Harrow "yeoman" to newly found a grammar school for the perpetual education, teaching, and instruction of the boys and youths of the parish, and to maintain two scholars at Cambridge and two at Oxford University, and the repair of the common ways between Edgeware and London and surrendered lands copyhold of the manor of Harrow, which he had only bought in 1569, to the governors for the use of the school, and that not at once, but only after the death of himself and his wife Joan or Jane. It was not for another fifteen years, viz. on Jan. 19, 1590, that he drew up the ordinances and statutes for the school. These provided that within half a year after his own and his wife's death the governors were to meet and appoint a schoolmaster, an M.A., and an usher, and if he left an heir of his body, pay them £20 and £10 each, if he left no heir (which happened), 40 marks (£26. 13. 4) and 20 marks (£13. 6. 8.) a year, with 5 marks each for fire. He must have been somewhat of a reactionary in religion, as he directed that both masters should be single men, unmarried and should be removed, if they married. Another £10 was to go for thirty sermons a year in Harrow Church, which the master or the vicar might preach at 6*s.* 8*d.* a sermon. Another £20 was to be distributed, 6*s.* 8*d.* each, to the sixty poorest householders in the parish. £20 also was to go for exhibitions to four poor scholars from the school, and "of the poorest sort," two at Gonville and Caius College, Cambridge, just augmented by Dr. Caius, who lived at Ruiship in the parish of Harrow, and two at Oxford, with preference for his own next of kin born in Harrow. He then directs the governors to accumulate the rents for three years so as to provide £300 to build the school, if he did not do it in his lifetime. But he ordered them nevertheless "to continue 20 marks a year which I the said John Lyon have used to give and pay for the teaching of 30 poor children of the parish." The governors were to set down "a meet and competent number of scholars as well of poor to be taught freely for the stipends aforesaid as of others to be received for the further profit and commodity of the said schoolmaster." For in 1590 £26. 13. 4. a year was much below the standard of payment of headmasters of the larger schools, seeing that even in 1510 Colet had provided for his master at St. Paul's, and prices had gone up enormously since then. The Rules added to the Statutes carried out this still further. "The schoolmaster may receive over and above the youth of the inhabitants of the parish, so many foreigners [*i.e.* non-parishioners] as the whole number may be taught and applied and the place can conveniently contain, and of the foreigners he may take such stipend and wages as he can get, so that he take pains with all indifferently as well of the parish as foreigners, as well of poor and of rich, but the discretion of the governors would be looked to that he do." As the only lodging for the masters was one room each at each end of the school, there was clearly no room for boarders, who were not contemplated. The Rules set out the curriculum of instruction in full, and the humble character of the school is conspicuously shown by the fact that only five forms are contemplated, whereas in the great schools of the time VI, VII, or VIII were provided for. Very little change had taken place since the days of the earliest Winchester and Eton curriculums in 1525 and 1530. The pseudo-Cato's *Moralia*, or two-lined adages of conduct in Latin hexameters, were prescribed in the first or lowest form, Erasmus' *Dialogues* with Æsop's *Fables* and Mancinus' *Lines on the Four Virtues*, written about 1490, in the second form. In the third form Terence, Cicero's *Letters*, Ovid's *Tristia*. Only in the fourth form did they begin Cæsar's *Commentaries*, Cicero, *De Natura Deorum*, and Livy. In Greek Demosthenes and Isocrates, for rhetoric still was regarded as one of the principal methods and aims of education, and Heliodorus, Latin verses and themes. Hesiod is the only Greek poet, chosen because of his gnomic character. Disputations were still the means of inculcating grammar, the boys propounding to each other questions and answers. Half holidays were, as in the fourteenth century, rigidly excluded except on Thursdays. "Their play shall be to drive a top, toss a hand-ball, to run or shoot and none other." Archery shooting at the butts was still prescribed by law. Every parent on the admission of his son had to promise to allow him at all times works of devotion and piety for the great solace and encouragement of scholars occupied in learning in the same parish. To give effect to this intention the Queen willed and granted that there should be and therefore erected a grammar school consisting of a master and usher in the parish to be called the Free Grammar School of John Lyon. She incorporated a body of six governors, headed by Gilbert Gerard, Esquire, the attorney-general, to take care of the possessions, revenues, and goods of the school; and gave them license in mortmain to take and hold lands to a value not exceeding £100 a year. As if to show the absurdity of the modern theory that a Free School (*q.v.*) did not mean one free from ecclesiastical jurisdiction, the charter provided that if the governors failed to elect a new master on a vacancy, the Archbishop of Canterbury should appoint; and if governors made statutes, they should do it under the advice and consent of the Archbishop. The Bishop of London also had some visitatorial powers.

The phrase in the charter, *de novo erigere*, "to erect anew," has been thought to show the existence of a school at Harrow before Lyon's foundation. But probably the words simply mean to erect a new school. But there is, as usual in Tudor foundations, some evidence of a school in Harrow before. In 1567, Richard, son of William Gerard, one of the governors named in the charter of 1572, admitted a scholar of Caius College, Cambridge, was described as having been at Harrow School for four years, *i.e.* from 1563. But this may only have been the unendowed school of thirty boys maintained by Lyon. But a letter of the Roper family speaks of the destitute children of a keeper of Enfield Chase and Hyde Park being sent to Harrow School by Queen Mary, 1554–1558; but this again may be Lyon's unendowed school. A lease of some of the school property in 1596 speaks of " the newe school or church house of the parish," which shows that the school was then kept in it, and it may have been so kept previously to Lyon's day. That there was no school there in the fourteenth century seems to be shown by two extracts from the rules of the Rutny manor. In 1384 the court directed the seizure of the goods of "John Intowne, a bond-tenant (*i.e.* a serf), for that he against the will of the lord, the rector, delivered his son William into remote parts to learn the liberal arts." In 1356 the bailiff of the manor answered for a horse taken as a distress from the same John Intowne, because he placed William his son, a bond-tenant of the lord, to school without the license of the lord. That was the way in which the Rector of Harrow in those days manifested the love of the Church for learning and advanced education, under the very nose of the Archbishop of Canterbury, to whom Harrow belonged and where he not infrequently resided.

Though the charter of 1572 thus purposed to found and erect the school and its governing body, neither had a more than nominal existence. It was not till 1575 that Lyon made his first endowment of land at Harrow after the deaths of himself and his wife. He also made further additions, and in 1590 he issued the Statutes for the government of the school. Five articles defining the relation between the masters and the parents and children followed the statutes.

Still the school was not established. Lyon died Oct. 11, 1592, and his brass, with his portrait and that of his wife, may be seen in Harrow Church. She died only in August, 1608. Soon after the governors began building, but in 1610 a chancery suit in the interest of the road repair stopped proceedings. The school, which had more than double the stipulated sum, was only opened in 1615, a year after Charterhouse. The number of free boys was fixed at forty, ten more than Lyon had maintained in his lifetime. What number of foreigners then came, if any, we do not know. There is no evidence that the school was anything more than a small parish school such as Lyon intended until after the Restoration. Indeed, in 1668 the master went off, apparently to Lincoln Grammar School, without notice as to promotion. In 1669 William Horne, an Eton scholar and fellow of King's College, Cambridge, and undermaster under his father at Eton, was appointed master of Harrow. From that time dates the development of Harrow as a great public school on the same lines as Eton, and to its succession of Etonian masters Harrow owes its real creation, as Eton did to its succession of Winchester masters. Horne was allowed, contrary to the statutes, to marry, and was assisted to rent a house in the village in which to take boarders. A letter among the Verney papers shows that by 1650 there were " six score " or 120 boys there and several boarding houses, besides the headmaster's, kept by " Dames " as at Eton. The charge was £22 a year in the headmaster's, and £14 a year in the other houses, the parish supplying sheets, towels, pewter plates, a porringer and spoon. The archery prize of a silver arrow, shot for among the boys, dressed in gorgeous costume, which became as a social function a great attraction to the school, was instituted at this time. Horne died in 1685. After a short five years of William Bolton, who had been usher at Charterhouse, came another Etonian and King's man, Thomas Brian, who held office till his death in 1730. With the powerful assistance of James Brydges, the magnificent Duke of Chandos, who had built his palace of Canons at Stanmere in the parish, Harrow became, like Westminster, though in a much less degree, an aristocratic school for the Whigs, Eton and Winchester having fallen under Tory influence. The first eminent Harrovian, a ward of the Duke's, George Brydges Rodney, who won the great naval victory over the French in the West Indies, was a pupil of Brian's, who in 1721 numbered 144 boys. His son-in-law and successor, Cox, however, drank, and let the school down to fifty. He was removed in 1746, and again a Whig Etonian, Thomas Thackeray, the grandfather of the novelist, restored prosperity. Samuel Parr and Sir William Jones, of oriental fame, were among his pupils, Parr being head of the school at fourteen. He was afterwards second master there. But it was under Robert Sumner, another Etonian, that Harrow owned its first great statesman in Richard Brinsley Sheridan, the indicter of Warren Hastings. The number went up to 232. From this time the free boys began to fall. In 1780 there were only eight. Under Benjamin Heath was the first Harrow prime minister, the ill-fated Spencer Perceval. From 1785 to 1805 the school under the mastership of Joseph Drury again achieved considerable success; under Drury were five future prime ministers of England, Lord Byron, and many other members of aristocratic families. The appointment of Dr. Charles Butler (1805–1829) led to a second revolt, in which Byron took part, but the boys were soon won over by the new headmaster. As the school increased in numbers and popularity in the country generally, the local connections grew weaker; the governors were no longer resident, as was required by Lyon's Statutes, the poor were not being educated according to the bequest, and such poor boys of the locality who did attend fared ill at the hands of the aristocratic "foreigners." An appeal was made in 1809 to Chancery to enforce the statutes, but without avail. Harrow did not escape the general demoralization which seems to have prevailed in the large English schools at the beginning of the nineteenth century; there was a lack of discipline, a general viciousness and brutality, to control which required a very strong headmaster and a complete change of attitude. But some reforms were made, although classics continued to be the main part of the curriculum. Butler, himself a senior wrangler, introduced a little natural and experimental philosophy and Euclid, while under Drury English essays and verse had already been encouraged; in 1829 the first school magazine, *Harrovian*, appeared, and between 1829 and 1836 French was compulsory. The fifteen years following Butler's administration, despite the ability and scholarship of the headmasters, were years of rapid decline, partly as a result of the financial panic which then took place, partly through a distrust of the Public Schools. In 1844 Charles J. Vaughan (*q.v.*), a young man of twenty-eight, a Rugbeian and the favorite pupil of Thomas Arnold (*q.v.*), became headmaster, and at once there began a brilliant period in the history of the school. The numbers rose from 69 in 1844 to 315 in 1847; the moral tone of the school was raised; the monitorial system was improved, and a staff of earnest, capable teachers was brought together. The residents of Harrow again raised their objections that the school was not fulfilling the intentions of the founder. Vaughan skillfully placated them by establishing an English form in 1853, in which modern subjects suitable to the needs of the sons of farmers and tradespeople were taught. To "secure the boys from interference or annoyance from the Public School," the boys were "to regard themselves as entirely separate in all respects from those at the Public School as at present existing." Out of this arrangement there developed the Lower School of John Lyon. On the retirement of Vaughan in 1859, Dr. H. Montague Butler became headmaster, and established the school on its present basis. The Tercentenary Festival was held in 1871; with the passing of the Public Schools Act in 1868 new statutes were drawn up for the government of the school; benefactions continued to pour in; new buildings sprang up, and land was bought around the school to secure the seclusion and retreat which the suburban growth of London was making less possible; the curriculum was no longer monopolized by the classical studies; music and school songs became an important feature of the school under Mr. John Farmer, whose influence spread to many other schools; and in 1882 the broader relations of the school with the world were emphasized by the founding of a mission among the poor in Notting Hill, London. Under Bishop Welldon, Dr. Wood, and the present headmaster, Rev. Lionel Ford, Harrow continues to maintain the best tradition of the great Public Schools and to exercise an influence through its distinguished alumni in church and state, in the army, in professional and commercial life.

As at present organized, the school is divided into classical and modern sides, the latter intended for preparation for the army, civil service, or business. No boys are admitted under twelve years of age. The number of boys is about 600, the majority being on the classical side. There are seventeen boarding houses. Athletics play an important part at Harrow, as at most English schools; cricket is perhaps the most popular game, interest centering as it does on the annual match with Eton. Other sports are local football games, swimming, squash and rackets; a rifle corps was established in the days of Dr. Vaughan.

A. F. L. AND I. L. K.

See ATHLETICS, EDUCATIONAL; PUBLIC SCHOOLS.

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HART, JOHN SEELEY (1810–1877). — Normal and high school principal and educational author; was born at Stockbridge, Mass., on Jan. 28, 1810. He was educated in the academy at Wilkes-Barre, Pa., and at Princeton, graduating in 1830. He subsequently took a course in the Princeton Theological

Seminary. He was instructor at Princeton, 1832–1836; principal of the Edgehill School, 1836–1841; principal of the Central High School at Philadelphia, 1842–1858; principal of the New Jersey State Normal School at Trenton, 1863–1871; and professor at Princeton, 1872–1874. He established the *Pennsylvania Common School Journal* in 1844; edited *Sartain's Magazine* from 1849 to 1852, and in 1859 he founded the *Sunday School Times*. While principal of the Central High School he organized Saturday classes for teachers. Besides his *In the Classroom*, and a half dozen textbooks on the teaching of English grammar, language, and literature, he was the author of a number of essays on educational subjects. W. S. M.

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HARTFORD THEOLOGICAL SEMINARY, HARTFORD, CONN. — Founded in 1834 by the Pastoral Union of Connecticut as the Theological Institute of Connecticut at East Windsor Hill; moved to Hartford in 1865, and present title adopted in 1885. Students, men and women, who already hold college degrees are admitted. A knowledge of Greek is necessary for pursuit of the regular course, which extends over three years. Specialization is encouraged in one of five groups: Old Testament, New Testament, History, Systematics, and Practics. Courses in psychology and pedagogy are given in the Hartford School of Religious Pedagogy, and courses in comparative religions in the Hartford School of Missions, both of which institutions are affiliated with the seminary. The seminary confers the degrees of Ph.D., S.T.M., B. Sac. Mus., and B.D., on completion of the necessary courses and requirements, and the degree of S.T.D., *honoris causa.* There are twenty-seven members on the teaching staff.

HARTLEY, DAVID (1705–1757). — Physician and philosopher, educated at Cambridge. His chief work, *Observations on Man*, was published in two volumes in 1749. Hartley was the first to apply systematically the doctrine of the association of ideas, which he got from Locke and Gay. Sense impressions leave copies of themselves in the form of simple ideas of sensation, — the elements of which the mental life is compounded. By association these get the power to call up other ideas, and by connection with ideas of pleasure and pain, which constitute desire and aversion, they become also the starting point of actions. Action is due in the beginning to a mechanical overflow from sensory into motor channels. Hartley's medical interest led him also to formulate a physiological doctrine to which he attached great importance. This is the theory, suggested by Newton's *Principia*, of a physical cause of all mental facts in vibrations of the infinitesimal medullary particles. He does not press, however, the question of the precise relation between mind and body, but is content to postulate a correlation. His theory of association is practically independent of the vibration theory, which last was usually neglected by his followers. Hartley's treatment of education is incidental. The only application of the association doctrine which comes in very close contact with its methods in detail is his discussion of the development of language through hearing, speaking, reading, and writing. In a general way, however, Hartley has a high sense of the value of education, which is the great remedy for the needs of the time, and whose method is to be determined by tracing back the process through which associations have arisen. Since affections and passions are only aggregates of simple ideas, and the objects which excite them are due to association, moral education is amenable to the association doctrine. All motives go back in the end to personal pleasures and pains, but since desire can be shifted by a perfect fusion from the sensation to its antecedent, Hartley proclaims vigorously the possibility of "disinterested" motives, which morality and religion demand. These represent the end of all training, and Hartley advocates greater attention in education to sacred learning, and less to the "lewd poets." His doctrine of determinism also exalts the importance of education by basing development on the influence of environment; and the absence of any definite instinctive bias in his psychology goes to make training practically all-powerful. "With proper incentives and restraints few children would miscarry." "It is evident that children may be formed and moulded as we please." "If two beings whose affections and passions are at present in different proportions be exposed for an indefinite time to the same impressions and associations, they will at last become perfectly similar and even equals." The application of this as a means of social reform and reconstruction is, however, of later date; Hartley himself conceives that the traditional results of association are largely to be followed. The value of physical education also has some recognition, especially in one of his medical tracts. This also has a moral value in aiding to restrain desires. A. K. R.

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HARTLEY UNIVERSITY COLLEGES, SOUTHAMPTON, ENGLAND. — An institution founded in 1852 under the will of Mr. Henry R. Hartley to afford facilities for a liberal and professional education to the inhabitants of Southampton and the neighboring countries. Attention was at first paid only to preparation for army and civil service examinations; in 1871 a science and art department was opened and preparation was given for the examinations of the Science and Art Department, South Kensington. In 1896 work of a university character was begun, and in 1902 the institution was recognized as a university college and received grants from the Treasury. At the present day classes are conducted in arts and sciences, medicine and dentistry, engineering, education in the day training department recognized by the Board of Education. Evening classes are held in technical, commercial, industrial, and scientific subjects, and facilities are afforded for students who were unable to attend a secondary school to attend a course of evening work to qualify for entrance into the day classes. Hartley College does not grant degrees but students may be prepared for degrees, in other universities. Public lectures are conducted by the institution. Support is given by the Treasury and several local county and municipal authorities in and around Southampton. A proposal is now on foot to secure a university charter for the college. In 1910 the teaching staff consisted of twenty-eight teachers and the student enrollment was 230 in day and 500 in evening classes.

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HARTLIB, SAMUEL (?1600–1670). — The best known educationist of his time in England. He was the son of a Polish merchant by his third wife, who is supposed to have been an English lady. He came over to England from Germany (probably from Elbing) in 1628, and engaged in educational and other social plans. Hartlib, in a remarkable appeal to the House of Commons (about 1660), says that he had tried " to serve his generation," and amongst other things " by erecting a little Academy for the education of the Gentry of the Nation, to advance Piety, Learning, Morality and other exercises of industry not usual then in common schools." Evelyn (*q.v.*) states that he had relieved Hartlib's necessities, and evidently the latter was too lavish for his means in helping on educational and social plans. Yet in 1646 a pension of £100 a year was conferred upon him by Parliament, and afterwards this was raised to £300 a year.

In 1647 Hartlib wrote his *Considerations tending to the Happy Accomplishment of England's Reformation in Church and State,* in which he urges that it is the duty of the magistrates " to see schools opened, provided with teachers, endowed with maintenance, regulated with constitutions, and to have instructors and overseers to the observance of good order in this business." Without such reforms of schools " no other work of Reformation," says Hartlib, " will ever be effectual." His grading of schools was similar to that of Comenius (*q.v.*) and to that of Dury (*q.v.*). A further scheme in which the three joined, and about which Dury also wrote, was the establishment of an " Office of Address," to be established in London and to deal with both bodily and spiritual matters. It was to be useful to the poor, by helping them to employment and by distinguishing the industrious from the idle. This is, apparently, the first suggestion of a government bureau of labor. Next, the office was to be the medium of communication in " matters of the mind." The warden of the office was to keep all kinds of registers, inventories, catalogues, and lists containing the peculiar objects whereof he should furnish information for address to such as shall desire it, or to whom it might be advantageous for public good to send information. In religion the office was to help to rectify mistakes and prevent the increase of divisions and disorders about disputed opinions or religious practice. This was the especial mission of Dury, with whom Hartlib worked in close conference. In education, the Director of the Office of Address was to advance learning, in accordance with Lord Bacon's plea, and to " help to perfect Mr. Comenius's undertakings, chiefly on the Method of Teaching Languages, Sciences and of [founding] ordinary schools for all ages and qualities of scholars." Lastly the Office of Address was to encourage the dissemination of information about inventions, so as to increase their public serviceableness. Communications were thus to be established throughout the workers and thinkers of this country and also with the *savants* abroad. The important functions which he thought the State could perform in intellectual progress may be further seen in his *Description of the Famous Kingdom of Macaria, showing its excellent Government, wherein the Inhabitants live in great Prosperity Health and Happiness; the king obeyed, the Nobles honoured and all good men respected; Vice punished and Virtue rewarded. An example to other Nations; In a Dialogue between a Scholar and a Traveller,* 1641 [15 pp.]. To Hartlib's annoyance, *Macaria* was satirized in John Sadler's *Olbia* in 1660, where reference to " education of the children, in Sciences, Arts and Manufactures " is brought in, after the manner of Hartlib.

Besides writing on education, Hartlib was a center of a most remarkable educational group. John Milton (*q.v.*) wrote the *Tractate* in response to Hartlib's suggestion. So Dury was stimulated by him. Other friends were John Hall (*q.v.*), John Webster (*q.v.*), George Snell (*q.v.*), and Hezekiah Woodward (*q.v.*). As belonging to Hartlib's group, united in the desire to promote the advancement of learning under Baconian influence, were also John Pell, in his *Idea of the Mathematics*, Sir William Petty (*q.v.*), Abraham Cowley (*q.v.*), and John Evelyn (*q.v.*). Hartlib was also in close touch with progressive leaders abroad. He was apparently one of the leaders in the proposed invitation to John Amos Comenius (*q.v.*) to come over to England and to have Chelsea College assigned for his educational purposes.

In 1650 Hartlib wrote a notable tractate, *London's Charity enlarged, Stilling the Orphan's Cry*, in which he suggested to Parliament that it should grant £1000 toward work for the employment of the poor and for *the education of poor children*. He describes the laws and officers necessary for the control of children in a workhouse.

On the theoretical side of education, Hartlib published the following interesting collection of tractates: *A True and Readie Way to Learn the Latine Tongue, Attested by three excellently Learned and Approved Authors of Three Nations; Eilhardus Lubinus, a German; Mr. Richard Carew of Anthony, in Cornwall; the French Lord of Montaigne, Presented to the Impartial both Public and Private Considerations of those that seek the Advancement of Learning in those Nations. By Samuel Hartlib, Esq.,* 1654. Other educational works in the publication of which Hartlib took part are: (1) *Conatuum Comenianorum prœludia ex Bibliotheca S. H. Oxoniœ*, 1637. (The Address to the Reader, 2 pp., in Latin, is by Hartlib.) (2) *Reverendi et clarissimi viri Johannis Amos Comenii, Pansophiœ Prodromus*, etc. London, 1639. (8 pp. in Latin. To Reader by Hartlib.) (3) *A reformation of Schooles, designed in two excellent Treatises: The first whereof summarily sheweth the great necessity of a general Reformation of common learning. What grounds of hope there are for such a Reformation. How it may be brought to pass. The second answers certain objections ordinarily made against such undertakings, and describes the severall Parts and Titles of Works which are shortly to follow. Written many years agoe in Latine by that Reverend, Godly, learned and famous Divine Mr. John Amos Comenius . . . Now translated into English and published by Samuel Hartlib, for the generall good of this Nation.* 1642. (4) *A Continuation of Mr. John Amos Comenius School Endeavours. Or a Summary Delineation of Dr. Cyprian Kinner Silesian his Thoughts concerning Education: Or the Way and Method of Teaching. . . . Translated out of the Original Latine transmitted to Sam. Hartlib, and by him published*, etc. 1648. (See KINNER, CYPRIAN.) (5) *An Essay for Advancement of Husbandry-Learning; or propositions for the erecting a Colledge of Husbandry: and in order thereunto for the taking in of Pupills or Apprentices*, etc. 1651. (This invites contributions to be sent into Samuel Hartlib for the object named.)

Hartlib's name is also associated with the publication of many other collections, together with original contributions on such subjects as husbandry, "Lucriferous and fructiferous" experiments, planting of fruit-trees, setting out of land, silk-worms, bees; chemical, medicinal and chirurgical addresses, an invention of engines of motion, "a common writing."

F. W.

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HARTSHORN MEMORIAL COLLEGE, RICHMOND, VA. — An institution for the education of colored young women, established in 1884. Normal preparatory and normal, college preparatory and college, industrial, and music departments are maintained. The college course leads to the degree of A.B. The majority of the students are in the normal departments.

HARVARD, JOHN (1607–1638). — The first donor to Harvard College. The facts as to Harvard's life have become fairly well known in recent years. He was the son of a butcher, Robert Harvard, and was born in November, 1607, in High Street, Southwark, close to London Bridge. He was christened on Nov. 29, 1607. His father died of the plague in 1625. His mother, Katherine Rogers, married twice again, first to John Elletson or Ellison (who died in June, 1626), and then to Richard Yearwood (or Yarwood), Member of Parliament for Southwark. She outlived them all, and inherited money from each. She died in 1637, having made her will in 1635 in favor of her sons John and Thomas. John, who survived his brother, entered at Emmanuel College, Cambridge, on Dec. 19, 1627, and graduated in 1631, proceeding as Master of Arts in 1635. He married in 1637 Ann Sadler, the daughter of a Sussex clergyman, and, his mother being dead, sailed for New England, where Cambridge and Emmanuel men had preceded him. He became a townsman of Charlestown, Mass., on Aug. 6, 1637. "His house was on the site now marking the southerly corner of Main Street and the Alley leading up to the Town Hall" (J. Winsor, *Memorial History of Boston*, I, 395; III, XXII). On Nov. 2 he took "the Freeman's oath" and he and his wife became church members four days later. Though he, apparently, was not ordained, he acted as assistant to the Rev. Z. Symmes, and preached. On Apr. 26, 1638, he became a member of a law-drafting committee. This possibly was a committee appointed to deal with the question of Gorges and the Charter, which had reached an acute stage in April, 1638. Harvard was, for that age, a wealthy man as well as a scholar, and seems to have won at once respect and position in the new settlement. But his brief course was nearly run, and he died of consumption on Sept. 14, 1638, childless. By a nuncupative will he left half of his estate (subsequently valued £779, 17*s.* 2*d.*) and his excellent library of 320 volumes to the proposed school or college at Newton (*i.e.* Cambridge). The matter was not left in abeyance, and the college was built forthwith. In December, 1638–1639, it was ordered by the General Assembly that "the Colledge agreed upon formerly to be built at Cambridge shall be called Harvard College." J. E. G. de M.

See HARVARD UNIVERSITY; MASSACHUSETTS, STATE OF; COLONIAL PERIOD IN AMERICAN EDUCATION.

References: —

See under Harvard University.

HARVARD UNIVERSITY, CAMBRIDGE, MASS. — The oldest educational institution in the United States. Established by vote of the General Court of the Colony of Massachusetts Bay, Oct. 28, 1636, and made possible through a legacy in 1638 from John Harvard, the college was given the name of Harvard in 1639, and held its first commencement in 1642. The name Cambridge was adopted for the town which was to be the seat of the college because many of the leading men of the colony were graduates of the University of Cambridge, John Harvard himself having been a Master of Arts of Emmanuel College, Cambridge.

New England's First Fruits, a tract published in 1643, contained the following paragraph: "After God had carried us safe to *New-England*, and wee had builded our houses, provided necessaries for our liveli-hood, reared convenient places for Gods worship, and setled the Civill Government: One of the next things we longed for, and looked after was to advance *Learning*, and perpetuate it to Posterity; dreading to leave an illiterate Ministery to the Churches, when our present Ministers shall lie in the Dust. And as wee were thinking and consulting how to effect this great Work; it pleased God to stir up the heart of one Mr. *Harvard* (a godly Gentleman and a lover of Learning, there living amongst us) to give the one halfe of his Estate (it being in all about 1700. l.) towards the erecting of a Colledge, and all his Library: after him another gave 300. l. others after them cast in more, and the publique hand of the State added the rest: the Colledge was by common consent, appointed to be at *Cambridge*, (a place very pleasant and accomodate) and is called (according to the name of the first founder) Harvard Colledge."

The bequest of Mr. Harvard was the first of the private gifts for education which have distinguished American history from that day to this, while the act of the colony in 1636 marks the beginning of state aid to higher institutions of learning in America.

In 1642 an act was passed "establishing the Overseers of Harvard College"; and in 1650 "the charter of the President and Fellows of Harvard College" made the college a corporation, to consist of a president, five fellows, and a treasurer, in whom should vest the property of the institution, and by whom, under the general control of the Overseers, its affairs were to be directed. These acts have been supplemented by a long series of legislative enactments, and in 1780 were explicitly confirmed, with important reaffirmation of ancient rights and privileges, in a section of the Constitution of Massachusetts entitled "The University." Upon this foundation still rests the legal existence and organization of Harvard University.

Most of the presidents of Harvard in the seventeenth and eighteenth centuries were drawn from the prominent ministers of the neighboring churches; but two (John Rogers, 1682–1684, and John Leverett, 1708–1724) were laymen. The most distinguished of the early presidents were Increase Mather (1685–1701) and Edward Holyoke (1737–1769).

In the struggle in the colony between the Congregational clergy and the more liberal elements the college early tended toward the liberal side, and a crisis occurred about 1700. Cotton Mather (1663–1728), a leader on the conservative side, failed to be elected to the presidency, which his father had held; and it became in many ways evident that the orthodox Calvinistic party could no longer rely upon Harvard College. Mather accordingly interested himself in the college already established in Connecticut, and in 1718 was influential in securing for that new enterprise a generous gift from Elihu Yale, a merchant of London. Later in the eighteenth century another noteworthy epoch in the history of the college was made by the events of 1735–1745. At that time the president, the professor of divinity, and the other instructors took ground against the religious revival known as the "Great Awakening," and vigorously opposed the tenets and utterances of George Whitefield, the eloquent English evangelist, whose work had deeply stirred New England. The theological development in the direction of liberal views was completed in 1805, when, after a bitter controversy, Rev. Henry Ware, an avowed Unitarian, was elected to the Hollis professorship of divinity. The result of his election was the definite withdrawal of the Calvinistic party from the support of the college and the foundation of Andover Theological Seminary in 1808 and Amherst College in 1821. For more than half a century from the date of Ware's election, Harvard was a distinctively Unitarian college, controlled by the Massachusetts aristocracy whose capital was Boston.

In the seventeenth and eighteenth centuries Harvard received some financial aid from the State, but its support was mainly due to a continuous stream of private gifts from donors both in England and in the American colonies. The largest gift of the seventeenth century was a bequest of £1000 from Sir Matthew Holworthy. Among many large benefactions of the eighteenth century the most important were those of Thomas Hollis, a Baptist and the leading layman of the English nonconformists. Besides sending numerous gifts of money and books, he founded in 1721 the Hollis professorship of divinity, which is thus the oldest professorship in North America.

At the Revolution the college cordially sympathized with the American cause, and the names of nearly all the most prominent Massachusetts patriots are to be found on its list of graduates. In 1776, after the evacuation of Boston by the British, the honorary degree of LL.D. was conferred on George Washington, whose headquarters were then in Cambridge.

The endowment of the college at the opening of the Revolutionary War amounted to less than £17,000, together with certain rents of real estate. The corporation proceeded to invest substantially the whole of this property in Continental and Massachusetts certificates of public debt, so that the very life of the college hung on the success of the American arms. The result of their courageous and patriotic policy was that in 1793, after the close of the war, the endowment of the college was estimated at upwards of $182,000, invested in good securities. The nineteenth century saw a steady enlargement of this endowment from alumni and friends of the college, gradually swelling into the great annual gifts of the present day.

In the nineteenth century, down to the Civil War, the influence of Harvard College was extended beyond Massachusetts, sometimes as many as a fifth part of its students being drawn in those years from the South and the Middle States. It was intimately involved in the active intellectual life of New England, and a large proportion of the great literary figures of the time were graduates of Harvard (Longfellow, a graduate of Bowdoin, was professor here, 1836–1854, and spent his life in Cambridge); most of the New England poets and historians, and nearly all the liberal theologians and transcendental philosophers, were Harvard men. The most noteworthy of the presidents were John Thornton Kirkland (1810–1828), Josiah Quincy (1829–1845), and James Walker (1853–1860). In this period the resources of the university were increased, professional schools of medicine, law, divinity, and science built up, and the distinction of the college maintained by the names of such professors as Jared Sparks, Edward Everett (both of them afterward for short terms presidents of the college), Joseph Story, George Ticknor, H. W. Longfellow, J. R. Lowell, Benjamin Peirce, Louis Agassiz, Asa Gray, and O. W. Holmes, and of many eminent men among the alumni.

In these years a number of dormitories and other buildings were added to the equipment of the university and the endowment increased from $242,000 in 1800 to $2,250,000 in 1869. The list of the college faculty grew from fifteen members in 1810 to twenty-four in 1869. In 1803–04 the freshman class in the college numbered 57, and the total number of students in the university was 233 (besides a fair number of medical students); in 1868–69, the corresponding figures were 128 and (including the professional schools) 1043.

In respect to educational organization, the curriculum during the Puritan and provincial periods down to 1800 was gradually freed from the distinctively theological cast which it bore to some extent nearly to the end of the eighteenth century, and in 1790 had come to consist of Latin, Greek, mathematics (including astronomy), English composition, philosophy (metaphysical, moral, and political), theology, natural philosophy, and (the only option) either Hebrew or French. With the one exception noted, it remained a prescribed course of study for all alike, and was well fitted to introduce students to the branches of knowledge at that day essential to a liberally educated man. (See College, American; the section on the administration of the curriculum.)

In the earlier part of the nineteenth century the general intellectual activity of the time, united with the influence of several professors who had studied at German universities, caused many changes in the discipline and course of study of Harvard College. The efforts of George Ticknor (professor 1817–1835) and others led to tentative progress in the direction of an elective system of studies; and chemistry, geology, history, political economy, and other modern studies were brought in.

At the same time pregnant changes took place in the government of the university. Until 1800 the fellows of the corporation had been largely ministers; after that date it became customary to elect but one clerical fellow. (Since 1884 no clergyman has been a member of the corporation.) The distinction of the position was thereby decidedly enhanced. At one time Joseph Story and Lemuel Shaw, two of the greatest jurists that this country has produced, and Nathaniel Bowditch, the foremost American mathematician of his day, made three out of the five fellows. In 1843 the Board of Overseers was opened to ministers not of the Congregational denomination; and a still more important step was taken when the Commonwealth relinquished its representation in the overseers. From the beginning the Governor and other high public officers, including the council and later the whole state senate, had had seats on this board; but in 1865 the right of election was wholly transferred to the alumni of the college, and since that time the state has had no share in the administration of Harvard. This was the culminating event of a long struggle in which the orthodox party of Massachusetts, allied with certain political interests, had sought to wrest from the Boston Unitarians an effective share in the control of Harvard. But the result was not a partisan victory; it came about through the relaxation of the rancor of ancient controversies under the engrossing tasks and opportunities of a new period of national life, and it brought to the university no restriction of scope. By permitting the introduction into the overseers of persons not resident in Massachusetts, and in other ways, under what proved to be more democratic influences, the new organization led to an increase in size and power far beyond expectation.

Since the Civil War Harvard has shared in the growth upon which the whole North and West of the United States then entered. Its history in this period is the history of the administration of Charles William Eliot (born 1834; president 1869–1909). President Eliot was able by his foresight, breadth of interest, and skill in organization and administration, by his single-minded devotion to high aims, and by the dignity of his personal character, to use the new forces of the time, command innumerable gifts aggregating a great sum of money, and hold the enthusiastic loyalty of a rapidly increasing and able staff. In the forty years of his presidency he was able to see Harvard widely extend the borders of its work, quadruple in number of students, and establish its position as a great national university, influential throughout America and honored beyond the seas. His efforts were especially devoted to the complete application of the elective principle in undergraduate studies, the maintenance of strict standards of examinations for entrance and graduation, the inclusion of all branches of knowledge and the arts in the opportunities offered to students, the requirement of a college degree for admission to the professional schools, and the insistence on the highest scientific ideals in all the graduate and professional departments. His administration deliberately followed the principle of freedom as a moral force in the methods of student discipline and in the regulation of the undergraduate curriculum; and was conspicuous for firmness, generosity, and justice in the treatment of the faculties and officers of instruction.

The present president is Abbott Lawrence Lowell, at the time of his election professor of government in the university. The chief progressive policies of his administration thus far have been the introduction of a system by which undergraduates are compelled to adopt a definite aim in their choice of elective studies, the strengthening of the purpose to keep professional and technical work out of the undergraduate course of study, and a more careful fostering of the solidarity of undergraduate life.

In the government of Harvard the Corporation, a self-perpetuating body composed of the president, five fellows, and the treasurer, is charged with the executive control of both the financial and the educational administration. The Board of Overseers, consisting of thirty members elected by the alumni together with the president and treasurer of the university, possesses undefined but extensive powers. The consent of the overseers is requisite for the election of the members of the corporation and of professors, and for the appointment of all major officers of instruction and government. To the overseers are referred all important constitutional acts of the corporation and the several faculties; and they have the duty of inspecting every part of the university through numerous special committees, and of making recommendations to the proper administrative authorities.

The president is a member of all the faculties as well as of the governing boards, and in practice always attends their meetings. Professors and other higher officers are appointed by the corporation and overseers on the nomination of the president, after informal consultation with the professors of the department. In the medical faculty alone the board of full professors formally nominates to professorships. For the professional schools the several deans have, as a rule, complete responsibility for organization and educational work, with the control of the budget; but Harvard College and the Graduate School of Arts and Sciences are under the immediate direction of the president, the deans being mainly concerned with the supervision and discipline of the students.

The faculties are four: Arts and Sciences, Divinity, Law, and Medicine, each consisting of all those officers giving instruction in that faculty who are appointed for a term of more than one year. Instructors who are members of a faculty, as well as all professors, have a vote, and, save in the Faculty of Medicine, the higher grades of instructors possess no privileges not enjoyed by the younger men in the faculty. It is characteristic of Harvard that the heads of departments in the Faculty of Arts and Sciences have no authority of control, but are merely chairmen, who are frequently changed. This permits the younger men to fill these positions, and is believed to be of advantage to the university by enabling the assistant professors and instructors to exert a stronger influence for progress in educational methods. The faculties hold frequent meetings, — the Faculty of Arts and Sciences often meeting once a week, —and are active legislative bodies. The discipline of students and other administrative duties are devolved in the larger faculties upon administrative boards; and the Faculty of Arts and Sciences is divided into departmental committees, to which are intrusted important powers of detailed administration.

Harvard College is the heart of the university. With it is intimately associated the Graduate School of Arts and Sciences. By an anomaly among the professional schools, the Graduate School of Applied Science and (until 1912) the Graduate School of Business Administration are also under the Faculty of Arts and Sciences. There is no division into an undergraduate and graduate faculty of arts and sciences; and the courses of study in Harvard College and the Graduate School of Arts and Sciences are not sharply distinguished.

Entrance to Harvard College is by examination only, and many candidates are annually rejected. By the new system of requirements, adopted in 1911, the adequacy of each candidate's program of preparatory studies is separately investigated, and, if the program is found satisfactory, the result of his education is tested by four examinations: (1) in English; (2) in Latin or (for a candidate for S.B.) a modern language; (3) in mathematics or physics or chemistry; and (4) in that one which a candidate may choose out of a list of seven specified subjects. This plan, which is intended to bring Harvard into ready contact with the better high schools of all parts of the country, is at present maintained parallel to the old system, under which every subject studied in the preparatory course is tested by examination. Of the total number entering in the ten years 1901–1910, 44 per cent came from public schools, 56 per cent from private and endowed schools. Of the eighty-three candidates admitted under the new plan in 1911, 84 per cent came from public schools, 16 per cent from private and endowed schools. The degrees of A.B. and S.B. are given in Harvard College, the chief difference being that candidates for A.B. are required to pass an entrance examination in Latin.

Harvard has not favored the plan of interweaving the college and professional courses into a " combined course" for the two degrees, but has insisted that a student shall have substantially completed his work for a college degree before entering the professional school. A considerable number of students, however, complete all the requirements for the bachelor's degree in three or three and one half years.

The degrees of A.B. and S.B. and all other ordinary degrees are given only for resident work, except in so far as work in another institution is counted for advanced standing. In order to provide for students in the Summer School and in the extension courses, the degree of Associate in Arts was established in 1910. It calls for the same number of courses to be regularly attended as for a bachelor's degree, but requires neither entrance examinations nor technical " residence."

Since 1886 attendance at religious services has not been required of students. In the university chapel morning prayers are held daily, with a regular service on Sunday morning. The religious services are directed by a board of five preachers of various denominations, under the chairmanship of a resident professor who is in the relation of a college pastor. Each preacher gives several weeks of continuous service at the college, conducting the services and consulting with students. The work of the chapel is supplemented by the usual voluntary associations of students, — undenominational, Episcopal, and Roman Catholic.

The various departments of the university, with the date of establishment and the number of students and of members of the faculty in 1911–1912, are shown in the following table.

	DATE	STUDENTS	NUMBER IN FACULTY NOT INCLUDING THE PRESIDENT
I. Faculty of Arts and Sciences			179
Harvard College	1636	2262	
Graduate School of Arts and Sciences	1872	454	
Graduate School of Applied Science	1847, reorganized 1906	123	
Graduate School of Business Administration	1908	79	
II. Divinity School	1819	48	8
III. Law School	1817	808	10
IV. Faculty of Medicine			64
Medical School (transferred to Boston 1810)	1782	275	
Dental School	1867	154	
Total		4203	
V. Affiliated Students —			
Extension Students		11[1]	
Summer School of Arts and Sciences (1911)	1871	787	
Summer School of Medicine (1911)	1889	267	
Summer School of Dental Medicine (1911)	1911	11	

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[1] In addition to students (521) taking courses given by Harvard instructors in the Boston "Extension Courses."

The total number of members of faculties, omitting names counted twice, was 248 in 1911–1912. In addition, over 450 officers holding annual appointments were members of the teaching staff.

For admission to candidacy for a professional degree a prior degree from a recognized college or technical institution is regularly required, except in the Dental School, for which, however, entrance requirements with examinations are strictly enforced.

Among the more notable recent developments in professional instruction is the transformation of the School of Applied Science (formerly called the Lawrence Scientific School) from an undergraduate technical school, parallel to the college, into a graduate school, resting on a previous college course and including the following departments, in each of which an appropriate professional degree is conferred: engineering (civil, mechanical, and electrical), mining, metallurgy, architecture, landscape architecture, forestry, applied physics, applied chemistry, applied zoölogy, and applied geology. Recently established (1908) is also the Graduate School of Business Administration, designed through courses in accounting, commercial law, economic resources, industrial organization, banking and finance, transportation, and insurance to fit college graduates for administrative positions in the business world.

The Divinity School, originally Unitarian, is now an undenominational school of theology, and its faculty includes professors of three different denominations. With it has now become associated Andover Theological Seminary (Congregational), in consequence of the removal of the latter to Cambridge in 1908 and its formal affiliation with the university. The courses of the Faculty of Divinity and of the Andover faculty are so planned as to form one systematic body of instruction.

The clinical facilities of the Medical School have hitherto been provided at the Massachusetts General Hospital, the Boston City Hospital, and ten other hospitals and dispensaries in and near Boston. These facilities are now to receive an important increase by the erection, already begun, of the Peter Bent Brigham Hospital on land adjoining the property of the Medical School. This great hospital, which has a large endowment, is to be conducted, and its chief officers have been selected, by a joint arrangement between its trustees and the Medical School.

The chief scientific establishments of the university, besides the various laboratories, are the following: Mineralogical Museum (1793), Botanic Garden (1807), Astronomical Observatory (1843), Museum of Comparative Zoölogy (1859), Gray Herbarium (1864), Peabody Museum of American Archæology and Ethnology (1866), Bussey Institution (agriculture) (1871), Arnold Arboretum (1872), Harvard Forest at Petersham, Mass. (1907).

The University Library includes the main collection in Gore Hall and the libraries of the various departments, of which the library of the Law School (in 1911, 126,000 volumes, 14,250 pamphlets) and of the Museum of Comparative Zoölogy are the most important. The Divinity Library has now been united with the library of Andover Seminary to form the Andover-Harvard Theological Library of upwards of 100,000 volumes, without doubt the best equipment for the work of theological scholars to be found in this country. The University Library contained, July 1, 1911, 1,587,734 volumes and pamphlets; and its age, careful selection, and many valuable accessions by special gift give it a distinction far beyond its size.

Affiliated with the university are Radcliffe College (for women, established under an earlier name in 1879), Andover Theological Seminary (1808), already mentioned, and the School for Social Workers (1904). Extension teaching to persons mainly engaged in other occupations is carried on not only in the Summer School, but also through a share in the winter courses given in Boston under a committee representing Harvard, Tufts, the Massachusetts Institute of Technology, Boston College, Boston University, the Boston Museum of Fine Arts, Wellesley, and Simmons.

The grounds used for academic purposes (not including investments in real estate) cover about five hundred acres in Cambridge and Boston, together with the Engineering Camp property of seven hundred acres at Squam Lake, New Hampshire, the Harvard Forest of two thousand acres at Petersham, Mass., and the Observatory at Arequipa, Peru. The value of the buildings is estimated at upwards of $12,000,000. The total income-bearing endowment of the university, July 1, 1911, was about $24,300,000. The annual net income from all sources in 1910–1911 was upwards of $2,400,000, made up approximately as follows: income from investments, $1,140,000, fees and rents from students, $955,000; miscellaneous income, $58,500; gifts for immediate use (excluding gifts for buildings), $268,000. The expenditure was approximately as follows: for administration, $103,000; educational purposes, $1,368,000; scientific research and other activities, $526,000; aids to students, $184,000; repairs and care of the buildings and grounds, $166,000. The gifts and bequests to the university, large and small, from countless benefactors, have averaged for the ten years 1901–1911 over $1,740,000 annually.

Harvard University draws its students from every part of the United States; but a little less than one half of the whole number usually come from the neighboring population of the Massachusetts cities and towns. In the College 56 per cent of the students were from Massachusetts, 4 per cent from the other

New England states, and 40 per cent from outside of New England. A large proportion of the students both in Harvard College and in the graduate schools support themselves in part by their own work during their course. The scholarships and other beneficiary aid granted annually to students in Harvard College amount to upwards of $65,000. In the professional and other graduate schools upwards of $90,000 is annually available for this purpose. All aid is given specifically from endowments or from university income, never in the form of remission of the charge for tuition.

In Harvard College student life on all its sides and undergraduate athletic organization are highly developed. The most important athletic contests are those with Yale; next to these in student interest .come games and races with Dartmouth and Cornell. The more conspicuous student clubs are local organizations, not connected with the fraternities of other colleges; and but few of the society buildings provide chambers for students' lodgings. The social organization of the undergraduates in the college is wholly distinct from the life of the graduate and professional students.

The following inscription, set high over the stage in Sanders Theater, well states the ideals which have guided the history of Harvard:—

HIC · IN · SILVESTRIBVS
ET · INCVLTIS · LOCIS
ANGLI · DOMO · PROFVGI
ANNO · POST · CHRISTVM · NATVM · CIↃ · IↃ · C · XXXVI
POST · COLONIAM · HVC · DEDVCTAM · VI
SAPIENTIAM · RATI · ANTE · OMNIA · COLENDAM
SCHOLAM · PUBLICE · CONDIDERVNT
CONDITAM · CHRISTO · ET · ECCLESIAE · DICAVERVNT
QVAE · AVCTA · IOHANNIS · HARVARD · MVNIFICENTIA
A LITTERARVM · FAVTORIBVS · CVM · NOSTRATIBVS · TVM · EXTERNIS
IDENTIDEM · ADIVTA
ALVMNORVM · DENIQVE · FIDEI · COMMISSA
AB EXIGVIS · PERDVCTA · INITIIS · AD · MAIORA · RERVM · INCREMENTA
PRAESIDVM · SOCIORVM · INSPECTORVM · SENATVS ACADEMICI
CONSILIIS · ET · PRVDENTIA · ET · CVRA
OPTVMAS · ARTES · VIRTVTES · PVBLICAS · PRIVATAS
COLVIT · COLIT

QVI·AVTEM·DOCTI·FVERINT·FVLGEBVNT·QVASI·SPLENDOR·FIRMAMENTI
ET · QVI · AD · IVSTITIAM · ERVDIVNT · MVLTOS
QVASI · STELLAE · IN · PERPETVAS · AETERNITATES

J. H. R.

See the various topics under COLLEGE, AMERICAN; UNIVERSITIES.

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HASBROUCH, ABRAHAM BRUYN (1791-1879). — Statesman and college president; was graduated from Yale College in 1810. He was active in political life and was president of Rutgers College from 1840 to 1850. He published a number of historical essays.

W. S. M.

See RUTGERS COLLEGE.

HASKELL, DANIEL (1784-1848). — Geographer and college president; was graduated from Yale College in 1802. He was for many years teacher and principal of elementary and secondary schools, and was president of the University of Vermont from 1821 to 1824. His publications include *Gazetteer of the United States* (1843) and *Geographical Dictionary* (1844).

W. S. M.

HASSLER, FERDINAND RUDOLPH (1770-1843). — Textbook author and first superintendent of the United States coast survey; was educated in Switzerland. He was for some years instructor of mathematics in the United States Military Academy, and afterwards professor in Union College. He organized the United States Coast Survey, and was its first superintendent. His works include textbooks on arithmetic, astronomy, geometry, and trigonometry, besides numerous publications on scientific subjects. W. S. M.

HASTINGS COLLEGE, HASTINGS, NEB. — A coeducational institution opened in 1882 under the control of the Synod of Nebraska of the Presbyterian Church. Academic, collegiate, normal, music, and oratory departments are maintained. The entrance requirements are equivalent to about fifteen points of high school work. The three courses of the college, classical, scientific, and philosophical, lead respectively to the degrees of A.B., B.S., and Ph.B. The faculty numbers fourteen members.

HATCH ACT. — See AGRICULTURAL EDUCATION.

HAUN, JOHN ERNEST CHRISTIAN (1748-1801). — Educator who carried through a reform of the school system of Gotha (*q.v.*) at the end of the eighteenth century, when the schools had fallen into decay. He was appointed to the teachers' training school at Gotha by Ernest the Wise (*q.v.*) in 1780, and three years later became inspector of country schools. In spite of much opposition on the part of the clergy and nobles who protected the incompetent teachers of the time and feared a possible increase in taxation, Haun succeeded in securing a better class of teachers, a milder form of discipline, and sounder educational methods. Haun was the author of *The common-school method or practical instruction for inspectors and teachers of every* *kind of elementary school, also for private schools.* (Erfurt, 1801.)

See Gotha, School Reform in.

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HAURANNE, DUVERGIER DE. — See Saint Cyran.

HAÜY, VALENTIN. — See Blind, Education of the.

HAVANA, UNIVERSITY OF. — See Cuba, Education in.

HAVEN, JOSEPH (1816–1874). — Educational writer; graduated at Amherst College in 1835. Subsequently he studied at the Union and Auburn Theological Seminaries. He was professor in Amherst College (1850–1858), Chicago Theological Seminary (1858–1870), and the University of Chicago (1871–1874). He was the author of *Mental Philosophy* (1857), *Moral Philosophy* (1859), and *History of Philosophy* (1876). W. S. M.

HAVERFORD COLLEGE, HAVERFORD, PA. — The successor of Haverford School, established in the spring of 1830. The school was founded in order to provide a "guarded education" for the sons of members of the Society of Friends. A by-law in the charter provides that the twenty-seven trustees of the self-perpetuating Board of Managers shall be members of the Society of Friends. This board consists of a president, a treasurer, and a secretary, and twenty-four trustees elected annually in three classes of eight members, each class to serve three years. In 1856 the school was changed to a college, and was authorized by the legislature to grant degrees; but previously to this time the course had been as extended as in most colleges. It was still hampered with a preparatory department, which was not abolished until 1861.

The college maintains the usual undergraduate courses, admission to which is by examination only. Degrees conferred are A.B., B.S., and M.A. for one year's graduate study in residence. Fraternities are prohibited. Although the income of Haverford College is exceeded by that of about 115 colleges and universities in the United States, only eight of these pay higher salaries to professors; and the least rich of these eight has an income six times larger than Haverford. Only five American colleges have a smaller proportion of teachers to students (1 to 6.5). To the smallness of this ratio and to the unusual excellence of the instructing staff a large measure of Haverford's efficiency is due. The enrollment in 1910–1911 was 150 students. The faculty consists of twenty-four members. C. G.

Reference: —

Haverford College Alumni Association, *History of Haverford College for First Sixty Years of its Existence.* (Philadelphia, 1892.)

HAWAII, TERRITORY OF. — A group of eight islands in the Pacific Ocean, located 2100 miles southwest of San Francisco. There are some fifteen islands, large and small, but only eight are inhabited. These eight islands have a combined area of 6449 square miles, or about the size of Connecticut and Rhode Island combined, and about twice the size of Porto Rico. The total population in 1910 was 191,909, or about thirty to the square mile. This was composed of Japanese, 79,520; Chinese, 21,666; Portuguese, 22,701; Hawaiian, 26,108; Part Hawaiian, 11,912; Americans and Europeans, 14,409; Porto Ricans, 4896. The native race is slowly dying out, having decreased from about 250,000 in 1800 to 142,000 in 1822, 49,044 in 1872, and to 26,108 in 1910. Schools are maintained on only five of the islands, the other three being small and having very few inhabitants. The territory is organized into four counties, viz. Hawaii (the largest island), Maui, Oahu (including the city of Honolulu), and Kauai (including the island of Molokai).

Historical. — The Islands were known by the Spaniards for about a century previous to their formal discovery and the introduction of civilization by Captain Cook in 1778. Near the close of the eighteenth century they were united, by conquest, under one king, Kamehameha, and continued as a united kingdom until the revolution and abolition of the monarchy on Jan. 16, 1893. A provisional government and a constitutional convention prepared the way for the proclamation of a republic on July 4, 1894. The new republic applied for admission to the American Union, and a treaty of union was prepared, but later withdrawn by President Cleveland. When the Spanish War broke out, the republic of Hawaii was annexed by a joint resolution of the United States Congress, passed July 7, 1898, and on June 14, 1900 the congressional act organizing the territory of Hawaii went into effect. Since that time Hawaii has been governed by its own territorial legislature, and by a governor appointed by the President of the United States, and as a territory.

The educational history of the archipelago extends over a period of about ninety years. Soon after their arrival in 1821 the members of the first company of missionaries interested themselves in educational matters, the first spelling book having been printed in 1822. This may be regarded as the first step toward popular education in these Islands, but in the beginning it was an education of adults rather than of children. Between the years 1823 and 1827 a peculiar system of schools sprang up and spread rapidly over the Islands, and flourished for about ten years. The chiefs and their immediate attendants were the first pupils. From 1830 to 1840 the American missionaries maintained model schools at each of their stations. From this time the attendance of adults fell off rapidly, and the principal attention was thereafter given to the education of children. In 1831 the missionaries established Lahainaluna Seminary, on the island of Maui, chiefly as a training school for native teachers and preachers. Industrial training was from the first a prominent feature of the curriculum. A printing press and book bindery were attached to the school, numerous textbooks were published, and in 1834 the first newspaper was issued. The school has since been incorporated as a part of the public school system.

The history of the public schools of Hawaii extends over a period of about seventy years, the first school law having been enacted in 1841 by the king and chiefs in council. In 1843 a Department of Public Instruction was organized, and the official at the head was given the rank of Minister of the Crown. This position was filled by Hon. W. Richards, and, at his death in 1847, he was succeeded by Rev. R. Armstrong, the father of General S. C. Armstrong, of Hampton fame. In 1855 the department was remodeled and placed under a Board of Education, whose president exercised the same powers and was charged with the same duties as those formerly belonging to the Minister of Public Instruction. In 1896 the administration of the public schools was again raised to the rank of an executive department, to be presided over by a minister and a Board of Commissioners, it being provided that the Minister of Foreign Affairs should be *ex officio* Minister of Public Instruction. The act of Congress organizing the territorial form of government provided for a Superintendent of Public Instruction instead of an *ex officio* minister, but otherwise made little change. Some additional school laws have been enacted by the territorial legislature, but the form of organization remains very much as it was outlined in the revised school law of 1896. In 1909 a School Fund Commission was created, to investigate and report on methods of raising school funds. The report was made, and the recommendations enacted into law in 1911. A salary schedule, a school budget, and a committee on school estimates were provided for, and the school appropriations made a first charge on the treasury.

Present School System. — At the head of the school system of the islands is a board of six school commissioners and a Territorial Superintendent of Public Instruction, all of whom are appointed by the governor of the Islands. No person in holy orders or a minister of religion is eligible for appointment, and not more than two women shall serve on the board at any one time. The commissioners serve without pay, while the salary of the Superintendent of Public Instruction is fixed at $6000 per year. The Superintendent and three commissioners, or four commissioners in his absence, form a quorum for the transaction of business. This body, which has the functions of a State Board of Education, has general charge of the school affairs of the Islands, appoints and removes subordinate officers, fixes all salaries, and adopts rules and regulations, not inconsistent with law, for the government of teachers and pupils, and its officers and agents, and for the proper carrying out of the general scheme of education for the territory. It is responsible for the conduct of all educational affairs, which are under its entire charge and control. It may establish schools for secular instruction, at such places and for such terms as in its discretion may seem advisable and which the funds at its disposal will permit. It regulates the course of study to be followed, and may classify the schools as it deems proper. The schools established may include normal schools, high schools, kindergartens, schools for technical instruction, boarding schools, and evening schools, as well as day schools. Classes for such instruction may be established in any school. All school property is in its name and possession. Teachers' conventions or institutes may be called or permitted, and the schools may be closed to enable teachers to attend them.

The Superintendent of Public Instruction, when present, acts as president of the board, signs all warrants and official acts or documents, and presents a biennial report covering the work of the schools to the governor of the territory. A Secretary, together with such assistants and office help as may be necessary, is appointed by the commissioners to look after the business affairs of the department. He acts both as a secretary and a business manager, keeps a record of all proceedings, conducts all correspondence, keeps a record of all financial transactions, and is responsible for all records and documents of the department. He acts under the direction of the board, and holds office at its pleasure.

For the purposes of supervision and inspection the Islands are divided into three inspection or supervisory districts, and a traveling deputy superintendent, known officially as a Traveling Normal Inspector, is appointed for each. Visits are made by these officials to each school about three times each year. They also hold meetings of the teachers for the purpose of giving advice and promoting the interests of education; make inspections of grounds, buildings, and equipment; and serve as a means of communication between the Superintendent of Public Instruction and the teachers and the people. The islands of Oahu and Kauai comprise the first inspection district; the Islands of Maui and Molokai the second district, and the large island of Hawaii the third district. Each of these islands is in turn divided into one or more school districts, for each of which an agent is appointed by the Board of Commissioners, to serve under the Traveling Inspectors and to act as a kind of supervising principal for a group of schools. For each school having more than one teacher one of the number is designated as principal. The distribution of schools at the close of the year 1910 was as follows: —

ISLAND	PUBLIC SCHOOLS			PRIVATE SCHOOLS		
	Districts	*Schools*	*Teachers*	*Districts*	*Schools*	*Teachers*
Hawaii .	9	58	153	4	9	32
Maui . .	4	33	79	3	12	41
Molokai .	1	9	9	1	1	3
Oahu . .	5	36	193	2	30	189
Kauai . .	5	17	55	2	3	4

All private schools are subject to the supervision of the public educational authorities. Private schools can only be established by permission, based on a written petition setting forth the names of the pupils and parents, the name or names of the teacher or teachers, and the approval of the parents. If the teachers possess the necessary qualifications and are approved by the public school authorities, a permit is issued authorizing such a private school.

Educational Conditions. — The system of public instruction in the Hawaiian Islands resembles somewhat the county school systems of some of the Southern states, in that the schools of the Islands are managed as a unit, and by one board of education. The result is that there is a uniform system of education throughout the Islands. The course of instruction, the standards for teachers, and the salary schedule are uniform for the same kind of work throughout the Islands. The schools are maintained by appropriations and the proceeds of general taxation, and all salaries and other expenses are paid by warrants on the treasury. No differences exist among teachers on the basis of race, sex, color, nationality, politics, or religion. The sole basis and medium of instruction in all public and private schools is the English language. Tuition is free in all public schools. Free textbooks are furnished to those too poor to provide them. Attendance from six to fifteen years is compulsory. Private schools may be selected by parents, if they prefer, but all children of school age must attend some school taught in the English language. A system of truant officers, or school police, enforce the compulsory education law in the country districts as well as in Honolulu. All teachers and children must be medically examined and be free from disease.

Both the total population and the school population are very mixed. For 1910 the statistics as to teachers and children in the public and private schools were as follows:—

NATIONALITIES	PER CENT OF PUPILS		NO. OF TEACHERS	
	Public	*Private*	*Public*	*Private*
Hawaiian . . .	16.01	3.25	72	11
Part Hawaiian. .	10.28	4.56	142	22
American . . .	1.83	2.18	180	168
British	.41	.34	35	16
German	.61	.45	7	2
Portuguese . . .	14.70	4.51	33	11
Scandinavian . .	.20	.07	7	2
Japanese. . . .	22.04	2.47	——	5
Chinese	8.43	2.82	8	12
Koreans	.58	.09	——	3
Porto Ricans . .	1.30	.49	——	——
Other Foreigners .	1.99	.39	5	14
Totals . . .	78.38	21.62	489	269

It will be seen from the above that five nationalities — Hawaiian, part Hawaiian, Portuguese, Japanese, and Chinese — represent over 90 per cent of the total school enrollment in the Islands.

The course of study as outlined for the schools of the territory covers the usual eight grades, and is much like that to be found in American schools. Nature study, illustrative work, manual work, calisthenics, and music run through from the first grade; sewing and carpentry are taught under the head of manual work; and agriculture has recently been introduced as a phase of nature study. Domestic science is taught in a number of schools. Public high schools are maintained at Hilo, on the island of Hawaii, and at Honolulu, on the island of Oahu.

Teachers and Training. — The territory employed 489 teachers in 1910, and 269 were employed in private schools, in addition. The statistical table given above shows the cosmopolitan nature of the teaching force, as well as of the pupils in the schools. About 21 per cent of the public school teachers and about 30 per cent of the private school teachers are men.

Examinations for teachers' certificates are held at least once each year, usually during the summer vacation. Grammar grade and primary grade certificates are granted to those who pass. The examinations for the primary certificate are only open to those who have had one year of professional training, one year of teaching experience, or who are graduates of a high school; and the examinations for the grammar grade certificate are only open to those who hold primary certificates. Holders of a university degree, a normal school diploma, a life certificate, or of life grammar grade certificates issued in the states, may be granted a grammar grade certificate without examination. Life diplomas for the territory are also granted.

For the purpose of developing a teaching force from among those born and reared on the Islands, a territorial normal school has gradually been developed. It is located at Honolulu. It began, about twenty years ago, as an afternoon class to help those teachers who cared to attend. In 1895 it received government recognition, and a training school was developed. In 1905 a normal school building was completed and occupied, and the school now offers courses of instruction for those coming direct from the grammar schools, who constitute about 80 per cent of the enrollment, and also a two-years' course for graduates of the high schools. The school is accredited by the California State Board of Education as of equivalent rank to the California normal schools. A large proportion of the teachers are still drawn from the mainland, though the native trained teachers are said to possess superior adaptability.

Other Institutions. — Besides the high school and the Territorial Normal School at Honolulu, island of Oahu, and the high school at Hilo, island of Hawaii, the territory maintains or assists in maintaining the Boys' Industrial School and the Girls' Industrial School, both located on the island of Oahu, and the Lahainaluna School, located on the island of Maui. The two industrial schools are reformatory in their work. The curriculum of the boys' school is largely agricultural and manual, while that of the girls' school is largely along the line of domestic work. The Lahainaluna School, whose history dates back to 1831, is a school for natives who wish to combine industrial training with general instruction. There are five classes in the school, covering about the five grades from fifth to ninth inclusive. Bookkeeping, military drill, printing, blacksmithing, carpentry, and agriculture are prominent in the work of the school. The total enrollment in 1910 was one hundred and five, made up of sixty-four Hawaiians, thirty part Hawaiians, six Japanese, four Chinese, and one Portuguese.

The United States Department of Agriculture has maintained an experimental station in Honolulu since soon after annexation, and in 1907 the Hawaii College of Agriculture and Mechanical Arts was established. This institution is substantially the same in character as institutions of a like kind on the mainland. It is supported in large part by territorial appropriations, but also receives from the United States the same annual appropriation ($50,000) as is given the agricultural colleges of the different states, and an additional appropriation of $30,000 for the agricultural experiment station.

Private Schools. — The Islands have a number of private schools, some of which are of considerable importance. The Kamehameha Schools at Honolulu are worthy of especial note. This institution was established under the provisions of the will of a Mrs. Bishop. a Hawaiian lady of high rank, who left the bulk of her large property in the hands of trustees to endow a school for the education of children, wholly or in part of native blood. There is a large boarding school for girls, and a boys' school combining manual and technical instruction with the ordinary school branches. The school also maintains a preparatory department. The institution is well provided with workshops and appliances, and ranks as a secondary manual training school. Oahu College is another institution worthy of especial mention. Founded by American missionaries in 1841, chartered as a public institution in 1849, and rechartered as a college, as well as a preparatory school, in 1853, the institution has grown with time and has accumulated a considerable endowment. A large number of the other private schools are under Catholic Church control. E. P. C.

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HAWLEY, GIDEON (1785–1870). — First state superintendent of public instruction in New York, studied at Balliston Academy and graduated from Union College in 1809, where he served as a tutor for a few years. He organized the common school system of New York and was the first state superintendent of public instruction (1812–1821). He was secretary of the Regents of the State of New York from 1814 to 1841 and a member of the Board of Regents from 1842 to 1870. He was also active in the movement for the organization of normal schools in New York. Besides numerous articles in educational journals, he was the author of *Truth and Knowledge* (1850). W. S. M.

See New York, State of.

HAWTREY, EDWARD CRAVEN (1789–1862). — One of the greatest headmasters and later provost of Eton College (*q.v.*). It was under his influence that reforms and innovations were introduced which gave Eton a prominent position in scholarship. Hawtrey was born at Burnham, near Eton, of a family that for generations had been connected with the college. After being himself educated there and at King's College,Cambridge, where he became fellow, he acted as private tutor for three years. In 1814 he was appointed assistant master at Eton by Dr. Keate (*q.v.*). He at once began to exercise an excellent influence on the pupils who came into contact with him by his high standard of scholarship and culture (in addition to the classics and Hebrew, he was a master in German, French and Italian) and encouraged a wide range of reading. In 1834 he became headmaster and inaugurated a series of much needed reforms in organization, equipment, and curriculum. He divided up the large classes which had prevailed, secured a special room for the sixth form, of which he took personal charge, introduced examinations and a competitive basis in classwork, provided better dormitories and improved the living conditions generally, closed the old Christopher Inn which had long been the center of excesses, and secured the abolition of Montem (1847). Much of his influence with boys was due to the introduction of a new spirit of sympathy; instead of the harsh discipline meted out by Dr. Keate, the boys were treated as gentlemen. In the first six years he had to meet with much opposition from the then provost, Dr. Goodall, but in his successor, Dr. Hodgson, he found a sympathiser and collaborator in many of his reforms. Under Hawtrey mathematics and modern languages were encouraged, better textbooks and methods of instruction were introduced, athletics and theatricals were promoted, and everything was done to provide interests to replace idleness and waste of time which merely led to bullying, brutality, and license. In 1852 Hawtrey became provost and supported the improvements of his successor in the headmastership. Hawtrey was a man of remarkable culture and literary and artistic taste; a lover of books, he collected a large library and encouraged the collection of a school library. His influence on Eton was as great as that of Arnold on Rugby, and, if it did not spread so generally on English education, this was due as much to the unique position of Eton as to the fact that Arnold was himself a teacher of so many teachers and that the Rugby spirit was published to the world in *Tom Brown's School Days*.

See Eton College.

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HAYNE, THOMAS (1582–1645). — Second undermaster at Merchant Taylors' School, 1605, and then usher of Christ's Hospital, 1608. He was a Leicestershire man, B.A., Lincoln College, Oxford, 1605. He gave £400 to buy lands or houses in or near Leicester to provide a rent of £24 forever for the maintenance of a schoolmaster at his native place, Thrussington in Leicestershire, to teach ten poor children, and for the maintenance of two poor scholars in Lincoln College to come from the Free School at Leicester or from the school at Milton, the schoolmaster to have £12 yearly and the two scholars £6 yearly. Hayne was regarded as a scholar, "beloved of learned men and particularly respected by Selden." His two educational books are: (1) *Linguarum cognatio, seu de Linguis in genere et de variarum Linguarum Harmonia Dissertatio*, 1639. (2) *Grammatices Latinae Compendium* (1640) written in Latin, while the most necessary rules are expressed in English opposite to the Latin, that the one may facilitate and give light to the other. Hayne deserves recognition for his simplification of Lily's Grammar, but his book is now perhaps most valuable for its history of Latin Grammar in England up to his time, contained in the "Address to the Judicious Reader." This is to be found reprinted in Foster Watson's *English Grammar Schools*, pp. 253–254. F. W.

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HAYNE, HAYNES, or HAINES, W. (d. *c.* 1631).—Headmaster of the Merchant Taylors' School from 1599 to 1624, of great prominence as a schoolmaster, who published (1) *Certaine Epistles of Tully verbally Translated, Together with a Short Treatise, containing an order of instructing youth in Grammar, and with all the use and benefit of verbal translations*, 1611. (2) Haynes' *Phrases, a very useful book to enable young scholars to make and speak eloquent Latin.* 2d ed. 1653. (3) *Lilies Rules construed*, 1653. This book marks a stage in the progress from the Latin Grammar in Latin to the Latin Grammar in English. F. W.

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Dictionary of National Biography, s. v. *Hayne, Wm.*
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HAZELWOOD SYSTEM. — See Hill, Thomas Wright.

HEADACHE. — A common complaint among school children. Usually it is not an ailment, but a symptom, — of eyestrain, decaying teeth, nervous fatigue, or the like, or it may be of impending acute disease. Some have maintained that there is a special form of headache due to the conditions of school life, *cephalalgie scolaire*. Under certain conditions this may fairly be maintained; for in certain schools where hygiene is ignored the congestion from prolonged sitting, the stooping posture, the strain upon the eyes and brain combined with the dry, overheated, stagnant, and impure air, are likely to produce headache; and while the headache is merely a symptom of perhaps general physical *malaise* it may fairly be attributed directly to the school. The studies by Key of Sweden and Holst and Magelssen in Christiania in Norway indicate that in only a very small percentage of cases is the headache of pupils caused by the school work. Apart from acute or chronic disease perhaps the most common causes of headache are the dry overheated air of the schoolroom, decayed teeth, astigmatism, and indigestion among the children.

When children complain of headache they should be treated sympathetically by the teacher and usually the physician or nurse should be called or the child should be sent home. Continued recurrence of headache in a pupil should lead the teacher to make a careful search for the cause, and the discovery of the real cause is often of the first importance for the educator. The correction of a sense defect or a slight change of regimen will often accomplish wonders for the comfort and success of the pupil.

W. H. B.

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Magelssen, A. Über das Kopfweh — hauptsächlich Migräne — an der Mittelschule. *Internationales Archiv für Schulhygiene.* 1905. Bd. I, pp. 285–300.

HEADMASTER. — A term used in England to denote the principal of a secondary school. Only in a few private secondary schools is the term used in America. The use of the word did not become general until the nineteenth century. Until then the distinction among members of a teaching staff was not that of headmaster and assistant master but between master and usher. Other terms were pedagogue, *ludimagister*, master, High Master (still in use at St. Paul's School, London, and the Manchester Grammar School), Chief School Master (Wellingborough), or *Archididascalus* (Westminster Statutes), while the usher was also known as undermaster, submaster, surmaster, *hypodidascalus* (Westminster), or *ostiarius* (Manchester Grammar School). The term " head " alone was frequently used of the chief officers of colleges and universities as early as the fifteenth century, and sometimes also of the principals of schools.

The term is also applied popularly to principals of elementary schools, but the official designation in government regulations is "Head Teacher."

HEALTH INSPECTION OF SCHOOLS. — See Medical Inspection.

HEALTH, INSTRUCTION IN. — See Hygiene, Personal.

HEARING. — The common term for the processes of auditory sensation or perception. See Pitch, Cord; Ear; Music; Tone.

HEARING OF SCHOOL CHILDREN. — See Ear.

HEARING, TESTS OF. — See Ear.

HEAT-SPOTS. — Points on the skin which are especially susceptible to stimulation from warm objects.

See Cold-spots; Pressure-spots; Pain-spots.

HEATING OF SCHOOL BUILDINGS. — It is not the function of a schoolman to decide between those features of heating systems wherein technical engineering knowledge is involved. School boards should employ competent engineers to install the heating system in large buildings designed for school purposes. But it should be remembered that there are many conditions entering into successful heating appliances for schools not so vitally necessary in those designed for homes or commercial buildings. It is the duty of superintendents, principals, and teachers to advise in such matters and to understand in a practical way the most economical and effective use of any system installed. In general a schoolman has opportunity to know far better the practical results of any heating system designed for schools than the engineer. Hence, there are certain demands from the school point of view which all successful heating systems must fulfill. Besides, outside of the larger city schools most heating systems are installed without the guidance of competent engineers, and very frequently the principal or superintendent is the only advisor in such matters.

Standards in Heating Schools. — The peculiar demands in large schools on heating systems may be stated as follows: (1) The heat should be generated in some central heating plant, either in the building or outside of it. (2) It must be delivered in the schoolroom in such manner as to be equally distributed. (3) It should be automatically regulated so as to prevent in the temperature of the room a variation of more than one or two degrees. By the use of thermostats this is now possible, and no heating system for schools is complete without an adequate supply of thermostats. No special discussion of these is needed here, for they are safely and effectively installed only by engineers of experience and skill. It may be well to say, however, that all janitors as well as principals of schools should thoroughly understand the principle upon which they operate in order to know when they are properly adjusted. (4) Heating systems should be planned to meet, without undue strain or effort, the lowest temperatures of the locality. This is a very important precaution, and it is false economy on the part of boards of education to neglect it. (5) Due account should be taken of the disturbing effect of strong winds during the winter season. This modifying influence of winds on the effectiveness of heating systems has not received the amount of consideration it deserves at the hands of either the engineer or the school superintendent. In the bleaker or more windswept areas of the country strong winds are frequently fatal to the effectiveness of what would otherwise be an adequate heating system. (6) Heating apparatus should be constructed and located with scrupulous regard for the safety and sanitary demands of the school. All stoves, furnaces, chimneys, firerooms, coal bins, or oil tanks should be so located and so constructed as to make it practically impossible for fires to start from these, or for dust, smoke, or odors to escape into the building. If steam is used as the thermal medium, the boiler capacity should be ample, so that a perfectly safe low pressure system can be used and yet furnish promptly and regularly an adequate amount of heat. If necessity demands a high pressure system, a registered engineer must be employed, and every precaution in the way of safety devices should be used. (7) There should be connected with each heating plant, especially in cold climates, some efficient system of introducing moisture into the air. While, strictly speaking, this is not a part of a heating system, it is so intimately connected with the effectiveness of the system, as well as the sanitary side of school life, that it deserves a great deal more thought than it has hitherto received in this country. (8) The location of a heating system with reference to the even distribution of the heat in the rooms is often a consideration of prime importance. With steam or hot water as the medium, the difficulty here suggested is more easily overcome; but with hot air furnaces the success or failure of the whole plant may depend on relative location. (9) Heating systems ought not to be divorced from ventilating systems, and hence the installation of the former should always have due regard to the quality of the air in the schoolroom as well as its temperature. Direct radiation systems therefore should never be used in schoolrooms save in the way of an auxiliary. In the northern latitudes it is sometimes necessary, to avoid expense, to use auxiliary direct radiation to secure adequate heat. (10) It is a matter of great economy in the milder climates of the country to be able to secure from a heating system a quick response with the use of a minimum amount of fuel. For it frequently happens that a little heat is needed for an hour or two in the morning, and none for the rest of the school day. Here the greater economy of a hot air furnace over hot water or steam in such climates is very clear. (11) Other things equal, it is always better to draw the air to be forced through the heating coils, from the south side of buildings, because experimental tests show in general a decided difference in temperature between the air on the north and south sides of the building. Suppose the air on the north is at the freezing point, on the south side the thermometer would show 37° F. This would mean the saving of practically one seventh of the fuel, for this five-degree difference in temperature means practically one seventh of the amount of heat necessary to bring a freezing temperature to that required in the schoolroom.

Systems of Heating. — *Stoves.*—Having stated these general, but fundamental, considerations, some detailed suggestions deserve attention. The old-time box stove has not gone from the country schools, and is yet frequently found in village schools, notwithstanding the fact that the jacketed stove has been much advertised and has proved both economical and far more sanitary. There are many varieties of jacketed stoves on the market; but the essential features are the same in all. There are four main reasons why the ordinary stoves in all country schools should give place to jacketed stoves or hot air furnaces: (1) A jacketed stove materially aids in ventilation (*q.v.*). (2) By its use more equable heat can be maintained. (3) Better distribution of heat to all parts of the room can be secured. (4) Such stoves can be more advantageously located in schoolrooms than ordinary stoves.

It is of course clear that the aid to ventilation mentioned above is only operative during cold weather. Many of these stoves have evaporating devices which are especially helpful in severe weather, in preventing the air from becoming too dry to breathe healthfully, and also, through this added moisture, in reducing the degree of temperature required for comfort. A temperature of 65° F. with proper humidity is as satisfying in cold weather as 70° F. when the air is abnormally dry.

Hot Air Furnace. — The hot air furnace or heater is simply a modification of the jacketed stove, or perhaps, speaking chronologically, a jacketed stove is a modification of the hot air furnace. The essentials of this furnace are: (1) A large fire box, and combustion chamber so carefully made as to permit no possible escape of gas, smoke, or soot save through the smoke chimney. (2) The fire pot and combustion chamber are surrounded with a jacket of brick, cement, or some good nonconducting material with sufficient space between it and the heated furnace for an easy circulation of air. (3) The fresh air duct opens directly underneath the fire pot and into the air space around it, so that as the air about the radiating surface is heated and moves upward, cool air from without will take its place. (4) This warmed air passes by means of the force of a fan or simply by the force of gravity, first to a centrally located chamber from which the ducts leading to the various rooms radiate. One branch of these ducts is also connected with a cold air chamber. By means of dampers, managed by a thermostat placed in a classroom, the temperature of the room can be kept approximately at the degree required. There are some serious defects connected with hot air furnace heating that should be considered carefully: (1) Unless they are constructed and set with the greatest care, there is always some danger from gas escaping from the fire box or combustion chamber into the air to be delivered into the schoolroom. The danger is especially glaring if the furnace is too small to furnish sufficient heat without very heavy firing. For it is evident that such fires would tend to warp, crack, or displace the radiating parts of the fire box or combustion chamber, thereby offering an opportunity for the escape of gas or smoke. Besides, if overheated, such furnaces permit the passage of carbon monoxide directly through the metal plates. (2) There is danger from overheating the air in furnaces, and rendering it dry, harsh, and "lifeless." Again, the only safeguard for this defect is to have a furnace of such dimensions that it will never be necessary to overheat the air in order to introduce sufficient heat into the schoolroom. Much warm air, instead of little hot air, is the correction to apply here. The amount of humidity needed can be supplied in a number of ways, but this topic cannot be discussed adequately here. (3) It is a difficult matter to properly apportion the ducts leading to the various rooms, so that, under the force of gravity or the uniform pressure of a fan, each room will get the amount of heat and fresh air needed. There have been more serious blunders made in this regard than perhaps in any other connected with the installation of heating plants. Long pipes, with short turns, no sheathing to prevent radiation and far too constricted to deliver a sufficient quantity of air without much friction, have been conspicuous causes for the failure of many expensive furnace installations No part of a heating or ventilating system needs the advice of an expert engineer more than the construction, location, and the proportioning of the ducts designed to carry the heated air to the schoolroom. This is especially true in connection with furnace heating. (4) It is more fluctuating than hot water, or steam heating.

There are some advantages in furnace heating that are worthy of note: (1) It is more economical in mild weather when artificial heat is needed for only a fraction of the school day. (2) It requires less time to get results, for it heats quickly and is more direct than hot water or steam. (3) It is cheaper to install than hot water or steam and, if properly proportioned to its load, it is far less expensive to keep in repair. (4) It does not require attention in cold weather during holidays as hot water or steam does. (5) It is of simple construction and does not require expert knowledge to handle, as does steam or hot water heaters.

Steam Heating. — Steam heating can be used for direct radiation, indirect radiation, or a combination of both. The advantages of this system for schools may be stated briefly as follows: (1) It furnishes a steady, continuous heat of comparatively low temperature, and hence does not "scorch" the air or reduce the humidity so strikingly as a furnace may. (2) The boiler room can be installed either in the school building proper or in a detached building even at some distance without serious loss in delivering the heat to the various rooms. (3) The radiators can be grouped into one unit or various units and readily proportioned to meet demands. (4) It can be utilized to introduce warmed fresh air into the schoolroom with or without a system of ducts from the basement. For example, many devices have been developed to install coils beneath windows or along outside walls, and, through an opening below, to allow the fresh, cold air to circulate about the coils and pass directly into the room. Where they are connected with some mechanical system of ventilation they can be grouped into chambers in connection with the ducts directly below the rooms they serve, and in this way the heat units demanded can be easily computed and applied. (5) It is more efficient in cold climates for the reason that it can be used in any combination desired, and can be expanded as exigencies demand. This of course is true only if adequate boiler capacity is installed.

There are some disadvantages in steam heating, and among these the following may be mentioned: (1) It is expensive in installation, and, if not handled by experienced mechanics, it is an expensive system to keep in repair. (2) It is not well suited to mild climates, for it is slow to heat and slow to cool. Hence it is wasteful and not sufficiently responsive for those climates where a little heat is needed in the morning and none for the rest of the day, or where a slight, steady heat is needed all the day. (3) There is always some danger in steam boilers, especially in high pressure boilers. They need constant attention, and demand a skilled mechanic to manage them economically and safely. (4) In cold climates during the winter months, fires must be kept going day and night and during holidays as well, in order to prevent the pipes from bursting. (5) It seems difficult to adjust steam radiators so as to prevent the pounding noises occasioned by the water from condensed steam coming into conflict with circulating steam. This difficulty has been much reduced in the past few years, but it is not yet perfected.

On the whole steam heating seems to be the most satisfactory for cold climates, and is being largely used in the more temperate regions. The business of the installation of a steam heating system demands technical knowledge, and boards of education will always save money by employing an expert engineer who knows school demands, as well as the technique of his profession.

Hot Water System. — The system of heating by hot water has not been used extensively in the schools of this country, though under favorable climatic conditions it is in certain respects well adapted for this purpose. In England it is more often used, and in that climate, save in extreme weather, has been found satisfactory. The advantages of a hot water system may be stated as follows: (1) It can be used, especially when supplied with a pump to facilitate circulation, in mild weather, without overheating and undue use of fuel. (2) It does not require such constant attendance as a steam heater, nor does it demand the technical ability to supervise. It is safer than steam, and is not subject to such rapid fluctuations as other systems. (3) It is ordinarily noiseless, and furnishes an acceptable quality of heat. (4) It can be delivered a long distance from a central heating source at comparatively slight loss in temperature, and for this reason it often lends itself to great economy of fuel and service by the use of one central heating station for several buildings. This point is worth considering because of the probable future tendency to group a number of school buildings together in suburban districts, where playgrounds, fresh clean air, and surcease from noise are possible.

On the other hand, it has some distinct disadvantages: (1) It seems to require more care to prevent leaks, especially when direct radiation is used in tall buildings and demands exacting attention in cold weather to prevent the pipes from bursting. (2) It is generally less quickly effective than other systems, and, unless a large amount of radiating surface is furnished, it will not satisfy the demands for heat in very cold weather. (3) It requires a greater superficial area or radiating surface to afford the same amount of heat than a steam heating system; and hence, where space must be economized either in basements or schoolrooms, this is a distinct disadvantage. (4) Most engineers claim that it requires "more careful installation, and nicer calculation of the sizes of piping" than is required for steam heating.

Owing to the fact that the amount of humidity associated with the air has a direct influence on the temperature demanded for comfort in schoolrooms, those in charge of modern school buildings, especially in the larger cities, have found it not only more wholesome to wash the air of dust and soot, but a matter of economy during cold weather because of the added moisture thereby introduced.

It will be readily admitted by all that colds and bronchial affections are much more generally common in winter than summer. This is not because disease germs are specially rampant in winter, but because the protection afforded by the mucous secretions of the air passages is reduced by the more rapid dissipation of this moisture by the dry air breathed in winter. (See COLDS.) The spaces between the molecules of cold air are restricted and hence the possible amount of water vapor occupying them is much smaller than that possible in the case of warm and hence expanded air. When cold air is heated to the temperature required for the schoolroom, necessarily the percentage of saturation is greatly reduced. Such air when breathed readily and quickly absorbs a great amount of moisture from the air passages. Warm dry air is greedy, so to speak, for water vapor, and will also quickly absorb moisture from the skin and render the body harsh and dry. But as a result of this evaporation the temperature of the body is lowered, for it is a principle of physics that a body losing moisture through evaporation is thereby lowered in temperature. To counteract the feeling of chill thus produced an abnormally high temperature must be maintained. If, however, after the cold air has been heated it be driven through sprays of water, or be made to impinge on or pass through water-soaked screens of coarse cloth or porous material, it will acquire a higher percentage of saturation, and when passed into the schoolroom will not absorb an undue amount of moisture from the bodies of the children. Hence the chill mentioned above will not be produced, and a lower temperature will satisfy. Some estimates show that at least 10 per cent of the cost of fuel will thus be saved in very cold weather, and in addition better hygienic conditions will be furnished. Many devices and appliances have been designed to secure this humidity and at the same time wash the air of dust and soot. One of the latest and most promising methods devised for this purpose consists in what is called an air washing and cooling fan. By this method "the air is forced through several successive layers of close-meshed wire screen, over which and through which water flows rapidly and in large quantities," and by the use of other means not necessary to specify here, the fan serves a triple purpose of air propeller, air washer, and humidifier. F. B. D.

See ARCHITECTURE, SCHOOL; VENTILATION.

Reference: —

See under ARCHITECTURE, SCHOOL.

HEBDOMADAL COUNCIL. — One of the governing bodies of Oxford University consisting of the Chancellor, the Vice Chancellor, the proctors, six heads of colleges or halls, six university professors, and six members of Convocation of not less than five years' standing. The Hebdomadal Council has the power of initiating University legislation and of framing statutes which may be accepted, rejected, or amended by Congregation and accepted or rejected by Convocation. The name of the council is derived from the fact that its meetings are held weekly.

See OXFORD UNIVERSITY.

HEBREW. — See ORIENTAL LANGUAGES AND LITERATURE.

HEBREW EDUCATION. — See JEWISH EDUCATION.

HEBREW, TEACHING OF IN REFORMATION SCHOOLS. — See ORIENTAL LANGUAGE AND LITERATURE.

HEBREW UNION COLLEGE, CINCINNATI, O. — A theological seminary established in 1875 for the training of rabbis and teachers in the principles of Reform Judaism. A preparatory department of high school grade and a Teachers' Institute are also maintained. The entrance requirements to the collegiate department are the same as those for the University of Cincinnati. The degree of Rabbi is conferred on candidates who fulfill the requirements and possess a degree equivalent to the A.B. of the University of Cincinnati. The College also confers the degree of Doctor of Divinity. There is a faculty of eight members.

HECKER, JOHANN JULIUS (1707–1768). — A German educator, the father of the "Realschule," was born at Werden on the river Ruhr, in what is now the Rhine province. His father and grandfather were schoolmasters, and he was educated in his father's school up to his fourteenth year, when he entered the gymnasium of the neighboring city of Essen. The rector of this school was a pupil of A. H. Francke (*q.v.*). In 1726 Hecker went to the University of Halle and, for a short time at least, came himself under the influence of Francke. He studied not only theology and philosophy, but attended also lectures on medicine and natural science. In 1729 he was appointed teacher of the "Paedagogium" in Halle, one of the schools founded by Francke, where for six years he taught all sorts of subjects, from Hebrew and the classics to chemistry, anatomy, and physiology. He also published a textbook of anatomy, one of physiology, and an introduction to botany. In 1735 he was called as pastor and school inspector to the military orphanage at Potsdam, where he attracted the attention of King Frederick William I. In 1739 he became the pastor of the new "Dreifaltigkeitskirche" (Trinity Church) in Berlin, a position in which he remained until his death. He first improved the elementary schools belonging to his parish, procuring the necessary means for this work through a school lottery, the shares of which were bought by people in different parts of Germany. In 1747 he opened a new kind of school, which was destined for the education of boys who were to be prepared for practical life. This school, which he called "Ökonomisch-mathematische Realschule" (now the Kaiser-Wilhelms-Realgymnasium), must be regarded as the mother institution of the whole system of modern (as distinguished from purely classical) secondary schools (Realgymnasien and Oberrealschulen) in Germany. He also did much for the training of teachers of the rural schools. The "General-Landschul-Reglement," the first general school law of Prussia, issued by Frederick II in 1763, was to a great extent Hecker's work. F. M.

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RANKE, F. *J. J. Hecker, Gründer der Königl. Realschule.* (Berlin, 1861.)

HEDDING COLLEGE, ABINGDON, ILL. — A coeducational institution founded in 1856 under the auspices of the Central Illinois Conference of the Methodist Episcopal Church. Academic, collegiate, music, and oratory departments are maintained. The entrance requirements are equivalent approximately to 15 points of high school work. The college grants the degrees of A.B., B.S., and Ph.B. The faculty consists of thirteen professors.

HEDGE, LEVI (1766–1844). — Educational writer and college professor, was graduated at Harvard College in 1792. He was tutor and professor in the college from 1810 to 1830. Author of *System of Logic* (1818), *Mental Philosophy* (1827), and other educational works. W. S. M.

HEDGE-SCHOOLS. — A term applied originally to those schools which sprang up in Ireland as a result of the Penal Laws (1704–1728) by which no Catholic was allowed to give or receive education or to go abroad for purposes of study on penalty of a fine of £100, while children so educated could not inherit property in Ireland or England. A result of these measures was that secret schools arose in which priests and others taught as much as was possible under the circumstances. "On the highways and on the hillside, in ditches and behind hedges, in the precarious shelter of the ruined walls of some ancient abbey, or under the roof of a peasant's cabin, the priests set up schools and taught the children of their race" (McCarthy, p. 13). In this way the national cause and national existence was kept alive. The term, however, soon came to denote any kind of a poor school, and so Thackeray calls Paddy Byrne, Goldsmith's teacher, "a hedge-schoolmaster." In Germany the identical term *Heck-* or *Heckenschule* in Hesse is the equivalent of *Winkelschule* (*q.v.*). In medieval France unlicensed schools were known as *Écoles buissonières.*

See IRELAND, EDUCATION IN.

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HEDONISM (ἡδονή, pleasure). — A term used to denote theories that make pleasure either the end, or the standard of intentional or conscious activity, moral behavior included. The ancient and the modern theories grouped under that name are, however, more widely different from each other than their common name would indicate. Ancient hedonism is associated with Epicureanism. Its chief motivation was revolt, on the one hand, against the moral theories which made virtue consist in fitting into the existing social order by performing the duties appropriate to the status in which a person found himself; and, on the other hand, against the theories which gave morals a purely rationalistic cast, basis, and aim. As against the first, Epicurean hedonism taught the advisability of abstinence, as far as possible, from civic life, and the cultivation of voluntary associations based on congeniality and friendship. As against the second, it emphasized the importance of the feelings, and of cultivating the various types of enjoyment naturally accessible to the individual. Contrary to the usual belief, it taught not surrender to appetite, but moderation of desire, on the ground that excessive desire was fatal to happiness. Ancient, like modern, hedonism was naturalistic in tone; but here again the motive was different, ancient hedonism being convinced that supernaturalism tended to fear of death and of the intervention of the gods, and hence was detrimental to a life of serenity and contentment.

Modern hedonism, in its influential forms, has been associated with an empirical philosophy and with utilitarianism. Its chief object has been to set up a concrete standard for measuring the worth of acts; their consequences in the way of pleasures and pains produced. Its interest was not in outlining an agreeable mode of life, remote from strife and disturbance, but the discovery of a scientific mode of estimating right and wrong methods of action. Of the conscious search for pleasure it has made little, generally holding, in fact, that happiness is best attained when not consciously aimed at — the so-called hedonistic paradox. In its most important representatives — as Bentham and the Mills — it has been more interested in the development of methods for judging the effects of legislation and administration, civil and penal, by tracing their effect among the pleasures produced and the pains entailed upon the masses affected by them, than in elaborating a code for right action in private life.

As a moral system, hedonism has had little direct influence upon educational theory or practice. Matters of pleasure and pain are, however, so closely connected with the motivation of conduct that it would not be difficult to trace an implicit hedonism in the use made of rewards promised and punishments threatened as motives to studious behavior. Asceticism, moreover, is a kind of inverted hedonism; involving the notion that man is so naturally prone to pleasure-seeking that the agreeable must be shunned as a temptation to evil. Ascetic notions underlie many educational ideas and procedures, especially those that cluster about the notion that there is something disciplinary and moralizing in tasks and exercises in the degree in which they are disagreeable (see FORMAL DISCIPLINE). J. D.

See UTILITARIANISM.

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HEGEL, GEORG WILHELM FRIEDRICH (1770–1831). — Born at Stuttgart and died at Berlin. He was the son of a secretary in the revenue office of the kingdom of Württemberg, and received a good education extending over eighteen years. With the purpose of pursuing theological studies, he attended the University of Tübingen (1788–1793); but, finding the prescribed theological and philosophical courses both dull and unfruitful, he devoted most of his time to classical and historical literature. His university certificate stated him to be of good ability, but of middling industry and knowledge, and especially deficient in philosophy. Six years (1793–1801) were passed as a private tutor, first in Bern and later in Frankfort.

His career as a university teacher began in Jena (1801–1806) as *Privat-docent.* Later he became professor extraordinary. His first important book, *Die Phänomenologie des Geistes,* which he characterized as his "voyage of discovery," was written here. The Battle of Jena interrupted the work of the university, and Hegel spent a year at Bamberg as a newspaper editor. Being appointed by Niethammer as professor of philosophy and rector of the new gymnasium at Nuremberg, a school of nearly 200 boys, he passed eight years (1808–1816) as a successful secondary teacher and headmaster. Hegel believed that classical studies formed the only sure basis for later intellectual work and development. At the same time he readily seized every opportunity for widening the curriculum and developing varied interests in the pupils. Military drill was introduced, and a school library and museum were started, to which parents and friends made gifts from time to time. In 1811 he married Marie von Tucher. One of his two sons, Karl, afterwards became professor of history at Erlangen. In addition to his work in the gymnasium, he wrote and published his greatest book, *Wissenschaft der Logik* (1812–1813, 1816).

His university career was resumed when he accepted the chair of philosophy at Heidelberg in 1816, declining calls at the same time to those of Berlin and Erlangen. He remained here two years, writing the *Encyclopädie der philosophischen Wissenschaften im Grundrisse* (1817). In 1818 he accepted the second invitation to the chair of philosophy at Berlin, made famous by Fichte (*q.v.*). His reputation was steadily growing, and he gathered round him a band of optimistic students and disciples. The *Grund-*

linien der Philosophie des Rechts appeared in 1820. His time at Berlin was given chiefly to teaching. His lectures on æsthetics, philosophy of religion, philosophy of history, and history of philosophy were published posthumously from his notes and those made by his students. In 1830 he was elected rector of the university. He died suddenly from cholera in 1831. "His philosophy may well be called the Prussian state philosophy during the years 1820 to 1840. It was the philosophical system officially acknowledged by the Ministry of Education" (Paulsen).

Hegel's Philosophy occupies a distinctive place in modern thought. The great German idealistic movement which, beginning with Kant, was developed in different ways by Fichte and Schelling reached its culmination and most complete presentment in the writings of Hegel. These philosophers all held that the universe becomes intelligible only as we adopt a spiritual interpretation. Benefiting as it were by the efforts of Fichte and Schelling to overcome the apparent dualism in Kant, Hegel became an evolutionist as well as an idealist in philosophy. The two worlds of nature and spirit are necessary to each other. The true meaning of life can be found only in the idea of progress or development. The essential condition of real progress is freedom. The solution of the problem becomes his doctrine of progress by antagonism: the necessity of two opposites and of a third which ever unites them on a higher level. This reconciliation of opposites is his key to evolution, — the only method of recognizing unity amid diversity. This position was reached only as the result of his development. He came to see that life is a process, that spirit must pass through many stages before it realizes itself, and that it is necessary to distinguish the stages of development from those of attainment. To attain self-realization, the Divine Unity must manifest itself in and through the many. And the many ultimately arrive at true freedom by learning to relinquish a lower form of freedom for the sake of a higher. One must learn to lose one's life in order to find it again at a higher level.

The educational views of Hegel follow directly from his philosophical theories. He wrote no separate treatise on education, but his views appear in passages in his philosophical writings, chiefly in the *Philosophy of Right*, where the sociological aspects of education are presented. The school addresses delivered while at Nuremberg also throw light on his theory and practice of teaching.

According to his idealistic view of evolution, the human stage is the most critical in the process. If man is to rise to a higher level of life, he must reconcile nature and spirit as fighting in himself for supremacy. The need of education appears related to this struggle, and arises from the fact that the child is but dimly aware of this necessity and ignorant of the true means of progress. In the child nature is stronger than spirit, the life of the senses more developed than the life of thought. Until he has maturity for self-direction, the family or the state in its institutions must provide the necessary nurture, training, and discipline. Education is the joint business of the family and the community working together for a common end. Parents have charge of the early education of the child until he reaches school age, when he comes under the influence of the community acting through its civil servants, the teachers in public schools. In the coöperation of the family with the school the common aim to be kept in view is morality. The moral man alone is free, and freedom is the essential quality of spirit. A liberal education frees the mind from the bonds of nature so that it may identify itself with the universal, and thus attain the higher level of spiritual life.

In the first stage of this education the child takes small part. The demand is from without, and he obeys, "but through instruction and education his own inner powers are awakened and he becomes conscious that knowledge, morality, and religion belong to his own nature." At this point of awakening, or "new birth," usually occurring at the secondary school age, the educational process becomes critical. What Hegel calls the "centrifugal force of the soul" now comes into play. The desire for "self-estrangement" is natural and necessary; but the step must take place under the teacher's guidance. The pupil must be taken right out of himself and his natural surroundings and interests in order to live the life of imagination and thought, — to apprehend the universal. The classical histories and literatures offer the best means to this end. Greek and Latin (as dead languages) shut the door upon the everyday self, and the teaching of them should be directed to making the pupil share in the thoughts, feelings, and actions of the ancients. By learning to live apart from himself, he realizes in part the nature and value of moral relationships and the meaning of the State. At the end of the return journey from this self-estrangement, the pupil finds himself again, but now in relation to universal life. This defense of the classical curriculum is far more philosophical than the argument from formal discipline which had for some time been advanced by German teachers. Hegel naturally laid much stress on the importance of moral training and discipline. He urged the necessity of firm discipline and a moral atmosphere in the school. Punishment is the right of the transgressor, and must not be withheld. Both direct and indirect moral instruction are necessary. The former he himself gave in connection with lessons in religion and philosophy (set forth in the *Propädeutik*), the latter through the ordinary school subjects.

Hegel's influence on education was very great during the latter part of his life and for some time after his death. His disciple and biographer, Rosenkranz (*q.v.*), devoted extended

efforts to setting forth his educational views, and many of his students tried to work out the educational implications of his philosophy. Froebel's pedagogy obviously owed much to Hegelian influence. In more recent years there has appeared a revival of his influence in the educational thought of America and England.
M. M.

See Harris, W. T.

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HEGIUS, ALEXANDER (?1433–1498). — An early humanist schoolmaster who contributed largely to the humanistic revival in northern Europe. He was born in Westphalia, and taught at Wessel and Emmerich before he came to the scene of his greatest activity, Deventer (*q.v.*), in 1465, where he became headmaster of the school attached to the Church of St. Lebuin. The school flourished so greatly under his charge that at his death it numbered about 2000 pupils. He associated with himself Sinthius, who probably influenced Erasmus (*q.v.*), and several members of the Brethren of the Common Life (*q.v.*). He himself appears to have taught the upper classes. Erasmus says that "from Hegius and Sinthius the school drew some savour of the true letters." And in a letter Hegius says: "All learning is futile which is acquired at the expense of piety." At the age of forty Hegius studied Greek under Rudolph Agricola (*q.v.*). The humanistic spirit was introduced into the school, and many of the northern humanists, *e.g.* Buschius, Murmellius, and others came under its influence. Hegius wrote several dialogues, which were published in 1503. They are catechisms on different topics, *e.g. De scientia quod eo scitur; De rhetorica; De moribus.* In the *De utilitate Græci* he insists on the value of a study of Greek for all departments of learning, "for to the Greeks we are indebted for everything."

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HEIDELBERG, THE RUPRECHT-CARL UNIVERSITY OF. — The University of Heidelberg, in the Grand Duchy of Baden, is the oldest university and to this day one of the most renowned institutions of higher learning in the German Empire. It was founded upon the model of the University of Paris by the Elector Rupert I of the Palatinate in 1386, the Papal Bull of Urban II being dated Oct. 23 of the previous year. At this time Prague, established in 1348, and Vienna, established in 1365, were the only universities in German-speaking territory. The work of organization fell largely to the first Rector of the university, the Dutchman Marsilius von Inghen. Although students flocked to the four faculties of the new institution in considerable numbers at the very start, the university did not reach the period of its greatest renown until the latter half of the sixteenth and the beginning of the seventeenth century, during which time it was the center of Humanism and Reform in Germany — this in contradistinction to the Catholic tendencies that had been strongly emphasized in the earlier days. This era of prosperity, however, was soon followed by one of stagnation, as the result of the Thirty Years' War and the devastation of the Palatinate by the French in 1689 and 1693, the university being compelled to close its doors from 1631 to 1652 and again from 1693 to 1700. A number of the fugitive professors continued their lectures at Frankfort from 1694 to 1698 and at Weinheim for two years subsequent. During the eighteenth century the institution was in the hands of the Catholic counter-Reformation, and was on the verge of extinction as a result of the severe blows dealt the town during the revolutionary upheavals at the close of the century. Not until Heidelberg with the Palatinate on the right bank of the Rhine was incorporated with Baden in 1803, did the university regain its former prestige, the elector Charles Frederick being responsible for a thorough reorganization of the seat of learning. The university to-day consists of five faculties; viz. theology (Protestant), law, medicine, philosophy, and pure science, the last mentioned having been made independent of the faculty of philosophy in 1890. A faculty of political science, established in 1803, was incorporated with the faculty of philosophy nineteen years later. The first psychiatrical clinic associated with a university was organized at Heidelberg in 1827, and one of the first university botanical gardens was laid out in connection with the faculty of medicine as early as 1593. The university also possesses an institute for cancer research (1906) under the directorship of Professor Czerny. A radiological institute was founded in 1909, and in the same year the Heidelberg Academy of Science was established. Among the eminent teachers who have been connected with the university may be mentioned Hermann Helmholtz in physiology, Bunsen in chemistry, Kirchhof in physics, Hegel and Kuno Fischer in philosophy, Boeckh in classical philology, Schlosser, Gervinus, von Treitschke, and Winkelmann in history, and Windscheid and Mittermaier in jurisprudence. The administration of the university is in the hands of a prorector, the reigning Grand Duke of Baden holding the office of Rector.

The library of the University of Heidelberg has had an interesting history, going back to the earliest days of the institution. It increased steadily in importance until the beginning of the seventeenth century, when it was generally regarded as one of the leading collections of the world. After the capture of Heidelberg by Tilly during the Thirty Years' War (1622), the most valuable portion of the library, the famous Bibliotheca Palatina, which included no less than 3527 manuscripts, was presented by Maximilian I of Bavaria to the Pope and removed to Rome, and a little later a somewhat similar fate overtook the newly gathered collection. Several of the manuscripts transferred to Rome in 1623 were restored in 1814, and later all of the old German manuscripts were returned. The present library, which moved into a new building in 1905, is only about a century old; it contains about 400,000 bound volumes, 200,000 dissertations and pamphlets, over 3000 papyri, 3200 documents, and 4000 codices, including the famous Manesse *Liederhandschrift* from the beginning of the fourteenth century. The latter is the richest collection of the kind in existence, consisting of 428 folio leaves, and containing over 7000 stanzas, chiefly South German lyric poems, by 141 authors, and 137 full-page illustrations.

In attendance Heidelberg is exceeded by ten German universities, its total enrollment in the winter semester of 1909–1910 being 2089 (194 women), this number including 155 auditors (52 women). Of the matriculated students almost half are found in the faculties of philosophy and pure science, viz. 954, medicine with 513 coming next, then law with 405, and finally theology with only 62. In the summer semester of 1910 the University of Heidelberg enrolled 2552 students. R. T. Jr.

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HEIDELBERG UNIVERSITY, TIFFIN, OHIO. — A coeducational institution founded in 1850 by the Ohio Synod of the Reformed Church. It maintains an academy, college, and departments of pedagogy, commerce, music, art, and elocution. The entrance requirements are fifteen units. The degrees of A.B., B.S., Ph.B., and B.L. are conferred on the completion of appropriate courses. There is a faculty of twenty-eight members.

HEIGHT AND WEIGHT OF SCHOOL CHILDREN. — See Growth.

HEINICKE, SAMUEL (1727–1790). — The pioneer of the German system of deaf-mute instruction; was born of a well-to-do peasant family in Nautschütz, near Weissenfels, Saxony. He attended only a village school, but at an early age showed a great love of books, which he had to satisfy in secret against his father's wishes. At the age of twenty-three he ran away from home to escape a marriage into which his father wanted to force him, and enlisted in the electoral body guard at Dresden. There he found time to pursue his studies in Latin and French, and later on even to give private lessons. In 1754 a deaf and dumb boy was brought to him, and he attempted to teach him to speak, using the method given by Amman (*q.v.*) in his book *Surdus loquens* (*The Deaf Speaking*). Wishing to devote himself entirely to teaching, he asked for his discharge from the army, but the outbreak of the Seven Years' War prevented the granting of his request. Having been taken prisoner by the Prussians in the battle of Pirna, he succeeded in making his escape and went to the University of Jena, where he enrolled as a student in 1757. Soon after, however, a Prussian recruiting party passed through Jena, and Heinicke, to avoid recapture by them, fled to Hamburg, where he became the secretary of the Danish ambassador Count Schimmelmann. Through the count's influence he obtained a position as a teacher and organist in the village of Eppendorf, near Hamburg (1769). There he renewed his interest in the training of deaf and dumb children, and acquired such fame that he was recalled to Saxony, where, in 1778, he opened the first German institution for deaf-mutes. In contrast with the Abbé de l'Épée, whose school for deaf-mutes, the first in the world, had been established in Paris in 1760, Heinicke instructed his pupils not in the gesture language, but in lip-reading and speaking. (See Deaf, Education of the, II, p. 257.) His object was to restore the deaf-mutes to society by making them use and understand the common spoken language.

In 1780 he published a book *Über die Denkart der Taubstummen* (*On the Mode of Thinking of Deaf Mutes*), in which he made a violent attack on the Abbé de l'Épée. From this arose a rather bitter controversy on the merits of the different methods of deaf-and-dumb training, which he carried on for the rest of his life.

Heinicke's ideas on general education show that, apart from his special vocation, he possessed remarkable pedagogic insight. In some respects he even anticipated Pestalozzi. He called upon the clergy to take the initiative in the improvement of the rural schools. He advocated a phonetic method of teaching reading, and insisted on giving children clear sense perceptions before abstractions. His vigorous insistence on the oral teaching of deaf-mutes has caused this method to prevail in Germany and most of the other countries of Europe.

F. M.

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HELMSTEDT, UNIVERSITY OF, GERMANY. — The last of the important universities which were due to the influences of the Reformation. Opened originally in 1571 as a *Pädagogium Illustre* at Gandersheim by Duke Julius of the House of Brunswick-Wolfenbüttel, it was removed to Helmstedt in 1574, and an imperial charter was obtained in 1576 raising the institution to the status of a university. The university was organized on plans drawn up by a disciple of Melanchthon with faculties of theology and philosophy. Students had to subscribe to the Augsburg Confession. For some time the university met with great success, especially in its theological faculty. In the eighteenth century there were professorships in the humanities, Hebrew, mathematics, natural science, logic and metaphysics, law, politics, and history. From 1779 to 1810 an important philological-pedagogical institute was maintained at the university, organized by Frederick August Wiedeburg. In connection with this seminar, teaching practice was obtained in the Pädagogium. The university was closed in 1809, probably through the rapid rise of its neighbor, the University of Göttingen (*q.v.*).

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HELPS, SIR ARTHUR (1813–1875). — Clerk to the English Privy Council and adviser to Queen Victoria, at whose request he prepared the Prince Consort's speeches for the press. He was a prolific writer on a variety of topics, among them *Conquerors of the New World* (1848) and *Spanish Conquest in America* (1855–1861). His *Friends in Council* (1847–1859), a collection of essays and dialogues, contains an essay on Education which " has told us more truth about education in a few pages than one sometimes meets with in a complete treatise " (Quick). Government provision of education is commended if it does not interfere with private schools. The end of education is happiness or contentment of the individual. Helps considers education under four heads: (1) religious, which he recognizes must be sectarian, but should not exclude tolerance and open-mindedness; (2) intellectual, which should be a training in mental power through emphasis on accuracy, attention, logic, and method, and many-sided pursuits as a general basis in an age of increasing specialization; (3) moral, in which the child shall be trained to moral independence by good examples; (4) physical, including ventilation and food, clothing, and bodily freedom. The education of women should be like that of men for the improvement of mental power, without any fear that similar education would lead to similar results in the two sexes.

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HELVETIUS, CLAUD ADRIEN (1715–1771). — Son of John Claud Adrien Helvetius, and descended from a famous family of physicians. He showed small aptitude for study in early life, but was fond of reading, and, in course of an apprenticeship in finance, amused himself by writing verse and cultivating social graces. Into mathematics and poetry he made numerous excursions, without, however, achieving marked distinction, while in philosophy his famous work, *De l'Esprit* (1758), consumed the greater part of seven years of work.

His reputation as a thinker rests on the work above referred to, which created a great furore when it appeared, though its merits do not warrant the attention it received. The chief points which he set himself to illustrate and enforce are these: (1) all the mental faculties are reducible to physical sensation, sentience, or feeling; (2) self-love, or self-interest, is the motive of all judgment, action, and affection; there is no such thing as liberty of choice or abstract right; custom (*i.e.* practical advantage) explains all our particular ideas of justice and moral worth; (3) the differences of personality or character among men depend on the inequalities of intellectual attainment due to education; and inasmuch as all are equally susceptible of education, we owe all we are to that cause; (4) all talent, therefore, all taste, imagination, and genius, are only particularly successful forms of the chances which enable some to gratify their instincts by means of education more easily than others. A work entitled *De l'Homme, de ses Facultés intellectuelles et de son Éducation,* was discovered after his death among his papers and published in 1772. It forms a sort of supplement to *De l'Esprit.*

Diderot (*q.v.*) had no difficulty in refuting these positions, which, as one critic has said, were all contradicted by the actual practice and life of their author. On two points his posthumous essay touched directly on education, namely in Sections I and X, where he expatiates, in a paradoxical way, on the potency of education and on the necessity of making all education, including that of the church, subject to the civil power. His doctrines, however, have not stood the test of experience and criticism; indeed, they are now thoroughly discredited. Legislation, upon which Helvetius relied to act the benevolent rôle of securing all the moral and educational goods for the people which they needed to make them contented and happy, has not proved the panacea he expected it would. Besides, he here argues in contravention of his fundamental theory that self-love is the motive of welfare. "The substance of what he proposes is better than the grounds on which his proposals rest" (Ueberweg). H. D.

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HENDERSON COLLEGE, ARKADELPHIA, ARK. — A coeducational institution established in 1890 under the auspices of the Methodist Episcopal Church, South. Academic, collegiate, music, and art departments are maintained. Fourteen units of high school work are required for entrance to the college courses which lead to the degree of A.B. There is a faculty of seventeen instructors.

HENDRIC COLLEGE, CONWAY, ARK. — A coeducational institution opened under its present title in 1889 under the auspices of the Methodist Episcopal Church, South. An academy is maintained in addition to the college. The requirements for admission to the college are fourteen units of high school work. The college offers two groups of studies, classical and Latin-scientific, both leading to the A.B. degree. There is a faculty of eleven members. The college has a productive endowment of $300,000, and a plant valued at $100,000.

HENKLE, WILLIAM DOWNS (1828–1881). — Superintendent of public schools; received his school training in the Springfield (Ohio) High School and Wittenberg College. He was principal of secondary schools in Ohio (1848–1854), superintendent of schools at Richmond and Salem, Ohio (1854–1864), and State Superintendent of Public Instruction in Ohio (1864–1871). Author of a series of mathematical textbooks. W. S. M.

HENRY VI, KING OF ENGLAND (1421–1471). — Henry VI, far more than Edward VI, deserves to be remembered as the founder of English schools and as an eminent promoter, though by no means creator, of English education. Like his successor, the boy-king suffered personally from overeducation. On June 1, 1428, his education, which since 1424 had been in the hands of Dame Alice Boteler, was transferred from the lady to Richard Earl of Warwick and Albemarle. "Whereas," says a writ of Privy seal in French, "it is expedient that in our youth we should be taught and indoctrinated in *bons meures lettrure langage e norture et courtoisie et autres vertus et enseignements,*" which articles in English annexed translate as "nurture, lettrure (*i.e.* grammar), language and other manere of connyng," and, above all, "*de nous faire traire a vertues at eschuer vices,* to draw us to vertues and to eschewing of vices." Therefore the earl was given power "if we estrange ourselves from learning or do wrong to reasonably chastise us as other princes of our realm and of other realms are accustomed to be chastised." He must have found the young king a difficult pupil to flog, as four years later, on Nov. 29, 1432, when the king was eleven years old, the earl laid before the Council a series of articles. In one he said that the King "is growen in stature of his person and also in conceit and knowlech of heigh and royal authoritee and estat, the which naturally causen him, and from day to day as he groweth shall causen him more and more to grucche [grudge] with chastising and to lothe it." So he asked, not to leave off chastising him, but for the support of the Council in doing it, and in appeasing any indignation the King might feel against him for doing it, with power to remove those whom he knew "at part and in prive not hering ye said Erle" who had "stured" him "from his lernyng." He obtained a promise that the whole Council would tell the King that it was their advice that he was chastised for his "defaultes," so that "for awe thereof he forbere ye more to do mys and entended ye more busily to vertue and to lernyng." The Council agreed. That Henry did not resent the Spartan training which Warwick thought necessary is shown by his making his quondam tutor and chastiser Duke of Warwick, the first duke in England not of royal blood. His experience of the Palace School, being brought up with the young nobles, an arrangement almost certainly made in imitation of the Casa Giocosa established by Gonzaga, the Marquis of Mantua, for his son and his nobles' children under Vittorino da Feltre in 1423, was no doubt largely responsible for Henry's foundation of Eton College (*q.v.*) within view of his birthplace and favorite residence at Windsor Castle, and its including, besides the original twenty-five, afterwards seventy scholars, twenty sons of noblemen. Eton, though by no means the first or the last of Henry's educational foundations, was the greatest and that to which he gave most personal attention. One of the earliest fellows of Eton, John Blakman, records how he took special care in the selection of the fellows, and how he always noticed the boys when they came for leave out to any of the court at Windsor, giving them a " tip " or " small present of money " and telling them to be good boys. His father, Henry V, had designed to endow a college at Oxford greater than all the existing colleges, for the " Seven Liberal Sciences " out of the Alien Priories (*q.v.*), suppressed because of their supplying sinews to French houses during the Hundred Years' War. Henry, or rather the Duke of Bedford, the Regent of France in his name, had already established a university at Caen in 1432, at first only for civil and canon law, which was not allowed at Paris, but extended after the English were expelled from Paris to theology and medicine, in the hope of keeping the subjects of the English King away from Paris. In 1441 another university was established for Henry's southern dominions at Bordeaux. The royal college of St. Nicholas, commonly called King's College at Cambridge, was provided by Henry's own act on Feb. 12, 1441, and built with his own money at Cambridge for a rector and twelve fellows, to be later enlarged to a provost and seventy fellows and brought into organic connection with Eton in 1443. In 1446 he founded a second college at Cambridge, called St. Bernard's, for a provost and four fellows, changed in the following year into the Queen's College of St. Margaret and St. Bernard, with his wife Margaret of Anjou as petitioner patroness and foundress, now called Queens' College because refounded and enlarged in 1475 by Elizabeth, queen of Henry's "traitor " Edward IV. The College of God's House at Cambridge was absorbed into Christ's College, founded in 1440 on a petition to Henry, to provide learned masters for grammar schools; the first secondary training college created *ad hoc* was perhaps inspired by him. But the great Oxford College of this epoch, Magdalen, owes its origin to Henry, and it was founded in 1448 by William of Waynefiete, whom he had taken from the headmastership of Winchester to be provost and organizer of Eton, and then made Chanceller of the Kingdom and Bishop of Winchester. Wayneflete improved on the example of Henry and of Wykeham by attaching to his college not merely one school, now known as Magdalen College School, at Oxford, but another at his native place, Wainfleet in Lincolnshire. Another college at Oxford, Oriel, founded a century earlier, received augmentation from Henry in the shape of scholarships for boys of Eton and also in the attachment of similar scholarships of the new school founded by him in London, in St. Anthony's Hospital in Threadneedle Street, that " alien priory " being converted into a secular hospital, and new endowments for the school planted in it being given in 1441. Henry's example was followed by the foundation of ten colleges and schools at Newport Salop; by Thomas Draper in 1442, by Archbishop Kemp in Wye College, Kent (now an Agricultural College) in 1447, by augmentation of Fotheringhay College, Northamptonshire, by Richard Duke of York in 1440, by the college of chantry at Towcester, Northamptonshire, by Archdeacon Sponne Sept. 4, 1447. There were also founded the gild grammar school at Deddington in 1445, the chantry grammar school at Wokingham, Berks, by Adam de Moleyns, Dean of Salisbury, in the same year, the chantry grammar school of Robert Gryndour, notable for being " half-free," at Newland, Gloucestershire, in 1446; the gild school at Clare, Suffolk, by Richard, Duke of York, in the same year; the double chantry schools, of grammar and song, at Alnwich by the Earl of Northumberland, and his brother William of Alnwich, Bishop of Lincoln, in 1445; the chantry school at Great Baddow, Essex, in 1449; the gild school at Chipping Norton in 1451. The troubles that then ensued, arising from Henry's melancholic insanity and the Wars of the Roses, cut short the progress of education and the foundation of colleges and schools for twenty years. But even so the educational record of Henry VI's reign eclipses that of any other reigns but those of Edward III and Henry VIII, and Henry's own personal share in it was greater than that of any English king.

A. F.·L.

See Alien Priories; Cambridge University; Endowments; Eton College.

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HENRY VIII, KING OF ENGLAND (1491–1547) **and EARLY TUDOR EDUCATION.** — See Monastic Education; Reformation and Education; also Grammar Schools.

HENRY, JOSEPH (1799–1878). — First secretary of the Smithsonian Institution (*q.v.*). He was self-educated, and for several years private tutor in the family of Stephen van Rensselaer (*q.v.*). He was instructor in mathematics at the Albany Academy (1826–1832); professor at Princeton University (1832–1867): and first secretary of the Smithsonian Institution (1867–1878). He was one of the founders of the American Association for the Advancement of Science (*q.v.*), and made extensive researches in the field of electrical science. His published works include *Philosophy of Education* (1856), *Lectures on Physics* (1844), and two volumes of scientific papers published by the Smithsonian Institution after his death (Washington, 1880).

W. S. M.

See Smithsonian Institution.

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HENRY KENDALL COLLEGE, TULSA, OKLA. — A coeducational institution established originally at Muskogee, Indian Territory, in 1894. It was moved to its present location in 1907, and is under the auspices of the Presbyterian Synod of Oklahoma. Academic, collegiate, music, art, and expression departments are maintained. The entrance requirements are sixteen units. Classical and scientific courses are offered, leading respectively to the A.B. and B.S. degrees, and preparation is given for the study of medicine, law, and teaching, as well as the ministry and mission work. There is a faculty of twelve members.

HERACLITUS (*c.* 535–475 B.C.). — Known as "the weeping philosopher," in contrast with Democritus, " the laughing philosopher." He was a pupil of Xenophanes, and, like him, was interested in the physical explanation of the universe. His fundamental teachings were that fire is the primordial element, that all material things are in a continual flux and reflux of becoming and perishing, and that the harmony and unity of nature consist in its multiplicity and diversity. His teaching was materialistic and pantheistic, and anticipated many of the conclusions of modern science and philosophy. He is regarded as the founder of metaphysics, and has been held in especial reverence by the Stoics and Hegelians. His school numbered many disciples, the chief of whom was Cratylus, the teacher of Plato. Of his work *On Nature* only a few fragments remain. W. R.

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HERBART, JOHANN FRIEDRICH (1776–1841). — German educator and philosopher; born at Oldenburg, May 4, 1776. His father was a councillor, his mother an extraordinary woman who learned Greek with her son under his tutor in order to supervise his studies the more effectively. The boy Herbart was precocious and ambitious in his learning, devoted to mathematics, and talented in music. At eleven he began logic, and at twelve metaphysics, while the gymnasium of his native town, which he entered after he had already attacked these subjects under his tutor, provided him with additional opportunities for the study of his beloved philosophy and of physical science. From the gymnasium Herbart proceeded as a student to the University of Jena, there to fall under the spell of the fresh and dominating thought of the idealist philosopher Fichte (*q.v.*).

The influence of Fichte upon Herbart was profound, but it was not long before the pupil departed from his master on the principles of idealism and freedom. Herbart came quickly to the conclusion that man is not free in the sense of possessing a principle independent of circumstances and environment; and reverted also to the doctrine of Kant, that behind and underlying the world of appearances there is a plurality of real things-in-themselves that are independent of the operations of mind upon them. Herbart thus became the founder of modern philosophical Realism, as contrasted with the Idealism which denied the existence of things-in-themselves independent of any form of consciousness. Broader and deeper grew Herbart's devotion to philosophy, but it soon became complicated with another interest, education. In 1796 Herbart left Jena to be tutor to the sons of the governor of Interlaken, a duty which he appears to have fulfilled with rare conscientiousness and skill. It was his own experience, coupled with his philosophical thought, that already suggested to him, first, the enormous importance of cultivating a many-sided interest, secondly the value of the *Odyssey* as the point of contact in the early fellowship between pupil and teacher, and thirdly the idea of a method that should combine education and instruction without the subordination of either motive to the other.

In 1799 Herbart paid a visit to Pestalozzi (*q.v.*) at Burgdorf, but in the same year decided to abandon his post as tutor, which various events had combined to render untenable, and to devote himself anew to philosophy with a view to teaching it in a university. At this time, too, he had thoughts of the reformation of schools, and wrote *Ideas for an Educational Curriculum for Higher Schools* and a criticism upon Pestalozzi's *How Gertrude teaches her Children,* and *Idea of an A B C of Sense-Perception.* The emphasis of Herbart at this time was especially upon the use of mathematical forms to correct the undisciplined observations of the eye.

In 1802 Herbart departed to Göttingen, where he received his degree of doctor and began to teach education and philosophy. Those were troublous times in Germany, but Herbart remained faithful to the intellectual life, and put forth work after work of so finished and original a quality that in 1809 he was paid the high compliment of a call to the chair of Königsberg, previously rendered so illustrious by Kant. At Königsberg Herbart developed his psychological theories and transferred his educational efforts from the speculative to the practical stage by the foundation of a pedagogical seminary. This institution developed into a training college and school in which the mathematical instruction was given by Herbart in person; but its activities were unfortunately interrupted by the departure of its founder for Göttingen in 1833, owing to the hostility of the Prussian government of the day to democratic ideas and academic freedom. At Göttingen he continued to lecture and write on education and philosophy to within two days of his death.

Herbart's Educational Views. — Herbart was convinced that, although many elements are spoken of as entering into the end or aim of education, yet its one and whole work may be summed up under the concept *morality*. Since the days of Kant, it was recognized that the first thought which this concept suggests is the good will. Herbart reacted against the current idea that this good will has only to express itself spontaneously in the pupil. On the contrary, he maintained, the good will may and must be cultivated in the child by the teacher. Morality is for the teacher a natural event, which has its causes like other natural events. This appeared to Herbart to rule out of court the idea of a transcendental freedom of the will which makes it independent of the causes acting upon it. "Not the gentlest breath of transcendental freedom must be allowed to blow through ever so small a chink into the teacher's domain." Herbart perceives that, if this be so, another ground than that which is generally accepted, that is to say, a ground other than either utility or external command, must be found for morality. He finds it in æsthetic necessity. We have an original, absolutely independent æsthetic judgment, self-evident, and of peculiar nature, which gives us the sense of duty. Education will attempt to properly exercise this judgment, and therefore cultivate the good will by a revelation of the whole known world and every known age. Full knowledge is thus the ground of virtue. Instruction will guide the two courses of knowledge and sympathy to the highest ground of their union.

General Principles. — Herbart as a student of philosophy and history was thoroughly acquainted with the educational works of Locke and Rousseau. He regarded the ideas of Rousseau as theoretical and doctrinaire; those of Locke as worldly. Rousseau would educate a natural man, Locke a conventional man; but it would be as difficult to train a natural man as it would be for the natural man to live in actual society when trained, while the conventional education of Locke would involve too easy an acceptance of the life of the man of the world. "Conventional education seeks to prolong existing evils; 'natural' education means to repeat if possible from the beginning the succession of evils already overcome." The principal method of conventional education is intercourse by conversation and travel, of natural education experience; but the emphasis which Herbart believed to be the most important was on instruction.

Herbart was the first to perceive that education was thoroughly worthy to be a science of itself, and not a mere department of philosophy. Education had suffered, as medicine had suffered, by government as a remote and tributary province. It needed the eye of science and a psychology in which the total possibilities of human activity might be sketched out *a priori*. Nevertheless the individual can only be discovered by the educator, not deduced. The fundamental necessities in pedagogy are education through instruction, involving discipline (*Zucht*) as a part of itself and not as an external force, and science and mental force.

Herbart's Use of the Odyssey. — Education through instruction, with morality as its aim, involves the presentation to boys of such men as they themselves would like to be. Yet this presentation should not be made sporadically, but in the midst of a long series of other means of education. It must not be spun out of the teacher's imagination, which is not ideal or poetic. The only place in literature where the ideal vehicle for the education of boys is to be found is the classical age of childhood among the Greeks. Here the *Odyssey* stands first; and again and again Herbart recurs to the *Odyssey*, which he actually used in this manner, at first as a tutor, and afterwards in the training college at Königsberg, as the fittest starting-point for school education. The *Odyssey* elevates the pupil without depressing the teacher; and assists the boy in his task of recapitulating the great development of humanity.

Many-sidedness and the Method of Instruction. — Herbart perceived that the concentration which is the essential method of the cultivated man may become so exclusive as to falsify every other impression except that which is habitual. To avoid this danger, the educated mind should be many-sided. But can this be, without the destruction of the personality of the individual? Herbart was convinced that this opposition is overcome in the act of reflective thought, since the object reflected upon depends upon personal choice, while the power of reflecting comes largely through seeing many sides of a situation. Reflective thought is welcomed by the teacher; it is in fact his main reliance. The necessary steps in producing it in the pupil are according to Herbart's own analysis four — clearness, association, system, and method. The followers of Herbart have adopted these steps, now modified into five, as the formal basis which may ordinarily be used in the subdivision of a lesson period (*the formal steps of method*). According to this plan, the teacher at first assists the pupil to clearly distinguish his ideas, after which he presents the new material, which is subsequently associated and applied. Herbart did not distinguish the formal steps of method with the precision and finality that have been claimed by his followers; on the contrary, the steps were to him the factors in the process of thinking rather than the logical subdivisions of a lesson period. The formal steps are useful, however, in many lessons whose primary object is to impart theoretical information; while the analysis at present most in favor is into preparation, presentation, association, generalization, and application.

Interest. — The place of interest in education had never been satisfactorily determined before Herbart; and his analysis, while not final, is still probably the best we have. Interest is the one emotion which assists rather than retards the operations of reason. It normally involves the process of observation, expectation, demand, and action. In general it depends upon knowledge and sympathy; that is to say, knowledge of the manifold, of its law, and its æsthetic relations; and sympathy with humanity, society, and the relation of both to the Highest Being.

Herbart perceived that the idea of many-sidedness, unless limited in some way, might lead the teacher to encourage a pupil merely to dabble in many external things. In order to prevent the loss of unity that would result from such a method, he preferred to recommend to the teacher the cultivation of an internal many-sidedness only, that is to say, a many-sidedness of interest. Interest is like desire, will, and the moral judgment in being opposed to indifference; but it differs from these faculties in that it does not control its object, but depends upon it. Interest can be controlled by the educator, because it depends on its object, which the teacher can determine at least in part. Through interest the teacher can control the allied processes of observation, expectancy, demand, and action. The teacher will not hesitate to control the interests of children.

Instruction. — Experience gives knowledge, intercourse gives sympathy; and to attempt to dispense with these factors in education would be to give up daylight for candlelight. But experience and intercourse are not in the power of the teacher; besides, they are often wearisome. Instruction is in his power, and need never be tedious. It penetrates more deeply into the mind than either experience or intercourse; and concentrates all the objects of human interest in the bosom of the young. To the pupil experience and intercourse should flow more fully from his teacher than from the life around him. " Instruction must universally point out, connect, teach, philosophize. In matters appertaining to sympathy it should be observing, continuous, elevating, active in the sphere of reality." Herbart was convinced that " filling the mind " is the first duty of the teacher, because it is the content of the mind that regulates behavior. In order to create a satisfactory mental content, instruction when analyzed should be found to have covered the fields of empiricism, sympathy with mankind, speculation, taste, sympathy with society, and religion.

Character. — The seat of character is the will, regarded not in its occasional moods of caprice, but in its firmer and more uniform operations. There is a difference between the will of a child previous to reflection and the will of a man after reflection. The former kind of will is more easily educated, while it still remains for the latter to give the ultimate settlement and sanction. It is characteristic of the will that it reappears as the same, as if it had a memory. Self-contemplation further develops and establishes this unity, and creates what is called principle. But principle can never fully include the objective parts of character, and consequently every character is more or less subject to inward conflict.

None the less, the foundation of the moral life is in " a sober, clear, firm, and determinate judgment." It is this alone which can be trusted to control action. For human activity depends in the first instance on the circle of human desires, which are indeed partly sensuous, but partly determined by intellectual interests. We cannot desire what we are utterly ignorant of. Great moral significance is therefore attached to the circle of ideas. " The circle of thought contains the store of that which by degrees can mount by the steps of interest to desire, and then by means of action to volition." By this route even moral training brings us back to the method of instruction. " Instruction will form the circle of thought, and the circle of thought the character." A firmly established circle of thought is essential to moral strength of character, and is generally preferable to an extreme mobility which tends toward the frivolous and the new. In a normal boy the strength of character which is a resultant of fixed ideas is not of a kind to oppose too strong a resistance to the plant power of education. The essential principle of Herbart's theory of education is the dependence of the character upon knowledge. " Great moral energy is the result of broad views, and of whole unbroken masses of thought."

Discipline. — " Direct action on the youthful mind with a view to form is discipline." Herbart viewed discipline as continuous treatment which does not ordinarily resort to rewards and punishments, but which does so only occasionally and then for emphasis. It must not be monotonous; it must coöperate in the formation of the circle of thought. It must involve mental as well as physical activity, for both are healthy; above all, it must involve the habit of work of every kind. Discipline will gradually disappear after the cruder forms of government have already been abandoned in relation to the child. It vanishes as the youth comes to the stage where he takes over the control of his own education; while the work of instruction still goes forward to its goal in the formation of character.

Herbart's Philosophy and Psychology. — In philosophy Herbart began as a disciple of Fichte, by whom he was greatly fascinated; but his independent and critical spirit soon caused him to abandon the extreme idealistic position and to return to the original theory of Kant. He accepted and developed the Kantian dualism between the real and the rational. Ultimate reality consisted for him in a number of reals which give rise to the world of appearances by their self-preservations against one another. The soul is metaphysically one such real, without parts or faculties; but its reactions for self-preservation give rise to the appearance of presentations which become clarified as ideas. The ideas act as forces; the mind itself is a series of masses of them, each mass rising or falling from the threshold of consciousness according to its groupings and consequent trains of association. It is characteristic of the psychology of Herbart that the unit of mental activity is the idea; so that will, desire, interest, and feeling are all of them grounded in some sort of intellectual activity. In this way the psychology of Herbart supports in the most logical manner his emphasis upon instruction and upon the importance of the circle of thought for the formation of character. The ideas, as it were, are at strife with one another for the possession of the foreground of consciousness. They resist one another, and in this act of resistance each is changed into an effort to present itself. When hindrances are removed, the ideas will present themselves. The implication of this theory of mental activity for education is the supreme significance of the formation of right, strong, unimpeded groups of ideas. For the ideas are regarded as combining with one another, or attacking one another, according to mechanical laws that are subject to mathematical determination, after the parallel of the laws that govern the interaction of molecules according to the atomic theory of chemistry.

Because of his elimination of innate faculties from psychology, his use of mathematical processes, his insistence upon the need of empirical studies of psychological fact, and his thoroughgoing associationism, with its necessary emphasis upon "apperception" (*q.v.*) and interest, Herbart is regarded as one of the greatest psychologists of modern times. Because of his critical ability and the lucid conscientiousness of his logical deductions, and because he led a reaction against metaphysical idealism, in which he has been followed by such philosophers as Beneke and Lotze (*qq.v.*), he is equally preëminent among modern metaphysicians.

Herbart's Educational Works. — The principal educational works of Herbart are *Ideen zu einem pädagogischen Lehrplan für höhere Studien* (1801), an essay on Pestalozzi's *Wie Gertrud ihre Kinder lehrt* (1802), a criticism of Pestalozzi's *Idee eines A B C der Anschauung* (1802), *Die aesthetische Darstellung der Welt als das Hauptgeschäft der Erziehung* (1804), *Standpunkt der Beurtheilung der Pestalozzischen Unterrichtsmethode* (1804), *Allgemeine Pädagogik* (1806), *Erziehung unter öffentlicher Mitwirkung* (1810), *Über die dunkle Seite der Pädagogik* (1812), *Das Verhältniss der Schule zum Leben* (1818), *Briefe über Anwendung der Psychologie auf die Pädagogik* (1831), *Das Verhältniss des Idealismus zur Pädagogik* (1831), *Umriss pädagogischer Vorlesungen* (1835), *Umriss der allgemeinen Pädagogik* (1841). Of these the most important are the *Allgemeine Pädagogik* and *Umriss pädagogischer Vorlesungen.* The principal works of Herbart are accessible in English translations, under the titles of *The Science of Education,* translated by H. M. and E. Felkin; *Outline of Pedagogical Doctrine,* A. F. Lange and C. De Garmo (New York, 1901); Herbart's *A B C of Sense-Perception and Introductory Works,* W. J. Eckoff (New York, 1896); *Application of Psychology to the Science of Education,* B. C. Mulliner (New York, 1898); *Letters and Lectures on Education,* Felkin. In addition Herbart's *Textbook of Psychology,* translated by M. K. Smith (New York, 1894), should be consulted for an understanding of the ultimate and fundamental principles of his theory, which is based, however, as much upon the results of his own experience as the logical implications of his philosophy and psychology. P. R. C.

See Ability, General and Special; Concentration; Correlation: Culture Epochs; Method, General; Stoy; Ziller, etc.

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HERBART SOCIETY. — The National Herbart Society for the Scientific Study of Education was organized at the Denver meeting of the N. E. A. in 1895 "to study and investigate and discuss important problems of education. Its members do not subscribe to the doctrine of any one leader, but seek for fair and thorough discussion." Professor De Garmo was the first president, and Professor C. A. McMurry the secretary; the council included President Butler, Chancellor Elmer E. Brown, Professors John Dewey, Frank McMurry, Wilbur S. Jackman, Levi Seeley, and C. C. Van Liew. Yearbooks are published, and discussed at the annual meetings. In 1902 the scope of its interest was broadened, and the society became the National Society for the Scientific Study of Education, which "contemplates a serious, continuous, intensive study of educational problems. It stands for no particular creed or propaganda. In aim and spirit and method it seeks to be scientific." The Yearbooks are published by the University of Chicago Press.

HERBERT, EDWARD, LORD HERBERT OF CHERBURY (1583-1648). — One of the most original thinkers of his time. His views on education are to be found in the *Autobiography* and in his *Dialogue between a Tutor and his Pupil*, which was first printed in 1768. On reaching school age, children should have an attendant to take care of their manners as the schoolmaster attends to their learning, and the two tutors should not interfere with each other. After the alphabet is learned, then should be studied the shortest and clearest grammars, *e.g.* books (such as Comenius's *Janua*), in which Latin and Greek are given in parallel columns. He expresses disapproval of the logic of wrangling, he approves the parts of logic which help to "deduce proofs from firm and undoubted principles, to distinguish between truth and falsehood, and to discover fallacies." The education of most worth consists in the training in goodness and virtue, learning and knowledge; as to which Herbert, like Locke afterwards, regards virtue as much before learning.

In the *Dialogue between a Tutor and his Pupil* the pupil has made himself acquainted with logic, geography, chronology, and history. The tutor enlarges on the usefulness of a knowledge of botany, *i.e.* especially of herbs, on diagnosis of diseases, on astrology and astronomy. The tutor holds that amongst sciences, mathematics, divinity, and philosophy are the most important. Mathematics is the most "undoubted and certain" of the sciences.

F. W.

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HERDER, JOHANN GOTTFRIED (1744-1803). — One of the most eminent writers of the classical period of German literature; born at Morungen, near Königsberg. Receiving the rudiments of learning from his father, a poor sexton and schoolmaster, he entered the local Latin school, where the mechanical methods of teaching left him in a spirit of revolt which showed itself in his later ideas on education. In 1762 he went to the University of Königsberg, intending to study medicine, which, however, he soon deserted for theology and philosophy. He thus came under the influence of Kant, who led him to study Bacon, Locke, Hume, and Rousseau. To support himself he taught in a local school and showed such ability that he was appointed to the Cathedral School at Riga, where he gained an insight into the problems of education and school administration (1764-1769). On resigning his position he visited the most important educational institutions of France, England, and Germany, and in a diary which he kept he sketched the plan of an ideal school, not unlike the modern *Reformgymnasium* (see Germany, Education in), and later realized by him to some extent in the Weimar gymnasium. For a time he acted as private tutor and went with his pupil to the University of Strassburg, where he met Goethe, through whose influence he subsequently obtained the position of chief pastor and superintendent of schools in the Duchy of Weimar (1776-1803).

Herder's influence on German thought and education was profound. Although not himself a creative poet, he brought about an appreciation of native, original poetry in the folk-songs of all races. He laid the foundations of comparative philology and of a comparative science of religion and mythology. In his greatest work, *Ideen zur Philosophie der Geschichte der Menschheit* (*Ideas for a Philosophy of the History of Humanity* (1784-1791), he developed a magnificent conception of history as a continuous revelation of the divine spirit in humanity. (See Paulsen, *German Education, Past and Present*, p. 158.)

Herder was by nature eminently an educator. His occupation with science and literature was never looked upon by him as an end in itself, but always as a means of influencing other minds, and of social reconstruction through education. He worked indefatigably for the improvement of the Weimar schools, instituting a seminary for the preparation of rural teachers, raising their salaries, and even writing some elementary textbooks. His chief educational work, however, was in the field of secondary education, and there he is prominent as one of the leaders of the movement known as "Neo-Humanism" (*q.v.*).

The standard edition of Herder's works is that by B. Suphan (Berlin, 1877) in thirty-two volumes. The thirtieth volume contains his pedagogical addresses and articles. Some of the most important of his works, besides those mentioned above, are his work on the *Origin of Language* (1772), his collection of popular poetry, *Stimmen der Völker in Liedern* (*Voices of the Peoples in Songs*, 1778–1779), his translation of the Spanish romances of the *Cid* (1805), and his treatise, *Vom Geiste der hebräischen Poesie* (*Spirit of Hebrew Poetry*, 1782–1783). F. M.

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HEREDITY. — By heredity is commonly meant those characteristics which the child derives from his ancestors. It is evident, however, that these include many qualities that are transmitted through education. Hence the term has come to be restricted to characteristics that are derived from the original constitution of the germ cell from which the individual is developed. In so far as these qualities are similar to those of the ancestry, they are ascribed to heredity; in so far as they are different, they are denominated variations in heredity.

The extent of hereditary similarity between offspring and ancestry is plainly not revealed until the child has grown to maturity. What, therefore, is inherited is a tendency on the part of the germ cell to grow into the forms and functions of its progenitor. During the expansion of these tendencies they are in the higher species, and especially in man, so modified by environmental influences that it is difficult to determine how much of the adult equipment is derived from either source. (See Acquired Characteristics.) It is evident that education or circumstances cannot produce either genius or unusual talent; nor is it, as a rule, responsible for physical or mental deficiencies, although these may result from disease, imperfect nutrition, accident, etc. On the other hand, there can be little doubt that the difference between efficiency and incompetence, or between morality and immorality, is in most cases due in whole or in part to training and to the relative suitability of the conditions of life to the inherited peculiarities of the individual. Thus while education cannot affect those fundamental characteristics on which our rating among our fellows depends, it can develop in most a fairly high degree of efficiency in some specialty. The responsibility of the agencies for education is, therefore, not lightened by the fact that there are hereditary differences which it cannot create nor overcome.

It is more easy to compare the *functions* of heredity and of education in equipping the individual, than it is to compare the actual *amount* derived from the two sources. In general, heredity gives us a set of powers which furnish a fairly adequate basis to maintain life in a variety of conditions. It gives capacities. Education, on the other hand, fits us to one or a few specific conditions. Heredity adapts to the permanent, education to the transitory. Heredity gives to each generation a capital of approximately the same amount, leaving to education to invest this fund in the enterprises suggested by the circumstances of the individual. It follows that there is a line of demarkation between heredity and education. Heredity gives such specific qualities as are a permanently useful equipment for the species, together with the capacity to learn others such as will be needed to adapt the individual to the peculiar circumstances of his own life. The acquired characters, on the other hand, are not to any extent inherited, since, constituting as they do adaptations to conditions likely to vary from age to age and from individual to individual, their inheritance would be apt to burden the offspring with many useless, if not positively injurious traits. Thus heredity gives us the power of speech, but education determines the language, the style, etc.

The higher species find life conditions far more varied than do the lower ones. They need, in consequence, greater adaptability, greater capacity to learn. To facilitate learning their heredity consists more largely in imperfect instincts or instinctive acts. These are such as require education in order to be brought to such a form as to function effectively. In man, as Professor James points out, there are more instincts than in any other animal, but they are also more imperfect. Such imperfect instincts, together with the equipment of activities which is instinctively utilized to satisfy them, and the array of other activities that can be utilized to perfect the mechanism by which they may be adequately met, constitute the so-called capacities of the individual. (See Ability.)

Heredity has been defined as made up of characteristics derived from the original constitution of the germ cell. It should be noted, however, that such simple forms of reproduction as the mere division, or fusion of the parent body, or budding, do not involve specific germ cells. In such cases the offspring is simply part of the body of the parent, separated to assume a form better adapted to the continuance of life and growth. In most respects it resembles the mature organism from whence it sprang. The phenomena of heredity become more complex and striking where there are special reproductive elements, germ cells, which begin life in forms quite distinct from those of the parent, but tend to grow like the latter. The specific nature of those qualities in the germ cell which cause it with growth to assume more and more the form of the adult has been a matter of much speculation and dispute, and to-day the theories on the subject may be regarded as little more than conjectures. The older idea was that of preformation, that is, that a miniature of the adult exists in the germ cell and could be revealed to the eye, if our microscopes were sufficiently powerful. This theory contains the evident truth that the structures of the adult are, at least, implicit in the constitution of the germ cell. On the other hand, we have the theory of epigenesis, according to which the structures of the adult are a result of the development and differentiation of the germ cell. This theory may be said to have been fairly well established by the investigations of Wolff (1759) upon the development of the chick. Granting the truth of the idea of epigenesis, the biologist is still confronted with the difficulty of accounting for the regularity with which a germ cell under normal conditions differentiates into an adult form that is in the main a reproduction of that of the parent. What is there in the germ cell that causes the adult form to be implicit or predetermined in it? According to one view, which will be recognized as akin to the preformationist theory, the multiplication and differentiation of the germ cell is simply the separation of quantitatively distinct units, each of which represents a specific structure in the adult form. These units are supposed to be found in the nucleus of the germ cell. Spencer calls them physiological units, Weismann determinants. The theory more commonly held to-day is that the differentiation of the structures of the adult form is a result of the various tensions set up among the multiplying cells, and that these spring from the physical and chemical or physiological properties of the nucleus. In these properties the whole of the adult organism is implicit, very much as the whole of the geometry is implicit in the definitions, axioms, and postulates with which the geometer starts. They constitute the plan along the lines of which growth must tend to proceed, if it goes on at all.

We have so far considered the problems that arise because of the deposition in a minute and apparently undifferentiated germ cell of all the potentialities later revealed in the growth of the individual. There remains the problem of the source of these hereditary qualities. In this connection we have to consider first the relation of the germ cells to the body cells of the parent; second, the results of the union in the germ cell of a male and a female element, the sperm cell and the ovum; and third, the laws that determine the character of the offspring.

Two theories exist as to the relation of the germ cell to the body cells of the parent. According to one, which is typified in Darwin's notion of pangenesis, all the cells in the body of the adult contribute minute particles which enter into the germ cell. The latter is therefore the creation of the differentiated body cells, a composite of their representatives. According to the other theory, the germ cells are isolated from the body cells, and are not influenced by the history of these. As the germ cell develops, there is a separation between certain cells which remain in a primitive undifferentiated form as germ cells, and body cells which take the forms apparent in the developed adult. Thus the new generation springs from cells similar to those that gave rise to the parent, and not from cells modified by a life history. There is, in the language of Weismann, continuity in the germ plasm, or at least in the germ cells.

The theory of pangenesis is not supported by the existence of any mechanism evident to the anatomist. It is a purely hypothetical explanation to account for the inheritance of acquired characters; *i.e.* such as are the effect of external agencies upon the body cells. Inasmuch as such inheritance is undoubtedly comparatively slight, and is not demonstrably existent at all, it would seem that pangenesis is an improbable explanation of a questionable fact. On the theory of the continuity of the germ cells, the acquired characters would be, for the most part, not inherited. Only such general effects of the environment as could reach the germ cells as well as those of the body, *e.g.* the effects of nutrition, drugs, etc., would be impressed upon the tissue from which the new generation takes its rise.

Reproduction in the higher organisms usually involves the union of the sexual elements, known as amphimixis. On the other hand, with animals as high up in the scale of life as the articulates, parthenogenesis, or the development of the ovum without fertilization, often occurs. Experiments on the sea urchin show that the ovum of this species may be stimulated by chemicals so that it will begin to evolve into an individual. If all reproduction were of this character, the problem of the source of heredity would be simple. On the other hand, amphimixis presents a variety of sources from which the hereditary characteristics might spring. Among the earlier biologists some maintained that these traits all came from the female, the male element simply stimulating the ovum to develop; others held that all heredity came from the male, the ovum contributing merely nutriment and a favorable environment for development. Both views are now known to be erroneous. The hereditary characters may come from either parent or from both. They may come from grand-parents and include traits that have not appeared in the parents. They may even come from more remote ancestors. Such cases illustrate what is known as reversion. The reappearance of a trait long absent from the stock is called atavism. Degeneration is frequently a result of reversion or atavism. Where nearly all the characters of the offspring are derived from one or the other parent, the inheritance is said to be exclusive. The inheritance of special traits from either parent is called particulate. Particulate is opposed to blended inheritance, where a character in the offspring is a compound of characters derived from both parents. Eye color usually illustrates particulate inheritance. Stature more commonly is a case of blended inheritance.

The great variety of results thus displayed in the phenomena of hereditary transmission suggests the hypothesis of a complicated set of characters in the germ cells representing traits derived from a great number of ancestral sources. Weismann supposed that the process of determining which of these should make up the inheritance of any individual consists of a struggle between germinal units which he called germinal selection. The existence of such selection is not generally accepted by biologists. It is further evident that the formulation of laws of heredity that will enable one to forecast the character of the offspring of any sexual union must be exceedingly difficult. Such laws must cover the phenomena of reversion and atavism, of exclusive, blended, and particulate inheritance, as well as the liability to variation from any hereditary character.

So far only two laws of heredity have been worked out with anything approaching mathematical precision. These are Galton's law of filial regression and Mendel's laws of inheritance in hybrids. Galton's law of filial regression deals with the tendency of the children of unusual parents to approximate more nearly to the common type of the family or stock. Thus the average height of the children of a man and woman both very tall tends, if allowance be made for the difference in stature between the sexes, to be below that of either. This law is an illustration of the tendency toward reversion, and is explained by Galton as a result of the combination of ancestral influences in the heredity of the child. He holds that, in general, the hereditary characteristics are derived as follows: one half from the parents, one fourth from the grandparents, one eighth from the great-grandparents, etc. It is evident that this rule does not enable any very reliable prediction regarding the qualities of any particular child, but only the average tendency among a lot of children. It explains the fact that children of people of exceptional ability are so frequently mediocre. The same rule should also apply to the children of parents mentally deficient, who should average a better mentality than their parents.

Mendel's laws of inheritance in hybrids enable a much more definite prediction of the character of the offspring than does the law of Galton. It is not known, however, how widely they apply. Where Mendelian heredity exists, the two parents differ in respect to a certain characteristic. Their offspring all resemble one parent in this quality. The trait of this parent is therefore called dominant, while the opposed trait of the other parent is called recessive. In the next generation the recessive trait will appear in one of every four. The descendants of this individual will, if there be no intermixture, possess the recessive trait. It breeds true, or is a pure recessive. Of the other three in this generation of offspring, one, a pure dominant, will breed true to the dominant trait; the other two, which may be called impure dominants, will produce offspring divided as before between dominants and recessives in the proportion of three to one. The recessives will always breed true. One of every three dominants will do likewise, while the other two will be impure dominants, and will have their offspring divided into one fourth pure dominants, one half impure dominants, and one fourth pure recessives. Mendel established and confirmed his laws by experiments on varieties of edible peas. Tall peas, when hybridized with dwarfish ones, give a breed in which the tallness is dominant and the dwarfish quality recessive. Gray mice bred with white mice give a stock in which grayness is dominant and albinism recessive. Mendelian heredity has been shown to exist in maize, rabbits, silkmoths, poultry, etc. It has proved useful as a guide in the breeding of desirable types of plants and animals.

Other laws of heredity, such as that inbreeding strengthens the characteristic traits of a stock, whether these be desirable or the opposite, that it is apt to result in reversions, and also in diminishing fertility, size, and vigor, are as compared with Mendel's laws uncertain and not a safe basis for prediction.

As a final point, variations in heredity may be considered. In the offspring traits may appear which vary from any present in the ancestry. Sex undoubtedly may favor this variation. Moreover, it is likely that all living tissue, including the germ cell, has not only the tendency toward continuity or inheritance, but also that toward variation. Variations may be quantitative, "meristic," as variations in size, proportion of parts, etc.; or qualitative, "substantive," as variations in color, etc. They may be continuous or discontinuous; that is, slight, or so revolutionary as to produce suddenly new types, sports. A variety that is thus varying is called by De Vries a mutating one. He holds that the evolution of species takes place by such extraordinary leaps rather than by slow accumulation of continuous variations under the influence of selection. In this way he avoids the objection urged against Darwin's view; namely, that slight chance variations are inadequate to gain any such advantage in the struggle for existence as to favor the survival of their possessors. His view is that evolution takes place by heterogenesis or mutation, rather than by the natural selection of slight chance variations.

Another way of avoiding this objection to Darwin's theory is to suppose that variations in heredity may not merely be those that occur by chance, and so, if slight, incapable without selection of accumulating into a modification of types, but also that they may in many cases naturally tend toward better adaptation, that is, be orthogenetic.

It is likely that the tendency toward orthogenetic variation may not be inconsiderable, and that it leads on to progress without selective influences. E. N. H.

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HEREDITY, SOCIAL. — In the reaction from the doctrine of the inheritance of acquired characteristics (*q.v.*), it became evident that culture is not transmitted physically or biologically, but through the perpetuation of social customs and institutions; and that the individual comes to a personal participation in the culture of the race only by means of contact with the abiding social environment. The phrase "social heredity" was coined to express this indirect method of transmitting the achievements and acquisitions of the past.

See Eugenics, and the references there given.

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HERGENRÖTHER, JOHANN BAPTIST (1780–1835). — Bavarian educator and director of a normal school at Würzburg. Born at Bischofsheim of a poor artisan family, his ability attracted the notice of the pastor who prepared him for the University. He entered the University of Würzburg and studied theology. For a time he was curate near Würzburg until in 1818, through his eloquence and ability in imparting religious instruction, he was appointed Director of the normal school at Würzburg, attended by students of all denominations. Although himself a Catholic, he endeared himself to all by his broad-mindedness. His work shows almost entirely the influence of Pestalozzianism, as does also his *Erziehungslehre im Geiste des Christenthums* (*Theory of Education in the Spirit of Christianity*) in which he discusses educational theory, training, and method from the religious standpoint. In 1832 he was removed from his position for political reasons and became pastor at Bamberg.

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Rein, W. *Encyklopädisches Handbuch der Pädagogik,* s.v. *Hergenröther.*

HERIOT, GEORGE (1563–1623). — Founder of the school bearing his name situated in Edinburgh, Scotland. A goldsmith by trade, he was appointed crown jeweler to King James VI of Scotland and I of Great Britain. On his death, he bequeathed the bulk of his fortune for erecting and maintaining a hospital and for the maintenance, relief, upbringing, and educating, as far as the means would allow, of so many poor, fatherless boys, freemen's sons of the city of Edinburgh. The management of the trust funds was placed in the hands of the city magistrates and the city ministers. Steps were taken soon after his death to carry out the testator's wishes, and in 1659 the hospital was opened with thirty boys. At first the boys were merely housed within the hospital buildings, receiving their education at the high school of the city, until they were fitted to proceed either to the university or to enter upon apprenticeship to a trade. Gradually the in-

struction began to be given by the members of the hospital staff, until in 1809 it was resolved that it was no longer necessary for any of the boys to be educated at the high school. From that date until 1886 the hospital existed as a school giving both board and education to a number of fatherless boys. In 1837 the income of the trust was more than sufficient to maintain the hospital school, and it was resolved to open and to maintain a free, elementary day school for the education of the children of the poor. Gradually, as funds were available, additional schools were built, until in 1872 thirteen schools had been established, providing free education for over 3500 children. The Education (Scotland) Act of 1872 transferred the duty of making such provision to the State. In 1886 the boarding system at the hospital was abandoned, and in its place each selected applicant for the benefit of the trust received free education and a maintenance allowance of £20 per annum. The hospital school has now developed into a large secondary school providing an education of a modern type to over 1200 boys, and carrying its pupils to the doors of the universities. The benefits of the trust are now open to girls as well as to boys. In 1886 the governors of the trust took over the management of the Watt Institution and School of Arts, an evening school for the technical instruction of the artisan, and the transferred school is now known as the Heriot-Watt College. This institution has developed into a technical college providing both day and evening instruction for its pupils.
A. D.

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HEROIC EDUCATION. — The title given to a treatise on gentlemen's education written by a writer who only signs his initials — I. B. — in 1657. I. B. represents that a lady showed him the treatise when it was only a "confused heap, without method or embellishment," but that he recognized that it was "the product of some great and knowing spirit." He therefore edited it and published it with the title: *Heroick Education, Or Choice Maximes and Instructions, for the most sure and facile training up of youth, in the ways of eminent learning and virtues. A Treatise very necessary for all men; but most especially for such as undertake the charge, to govern the young Nobility and Gentry.* By I. B. Gent.
F. W.

See Gentry and Nobles, Education of.

HERON. — One of the great teachers of the Alexandrian School, and the leading engineer of the Greeks. He was formerly thought to have lived in the first century B.C., but later investigations have led to the belief that he flourished in the first century of the Christian era. He was interested chiefly in mensuration, and his formula for the area of a triangle in terms of its sides still appears in elementary textbooks. This formula is $A = \sqrt{s\ (s-a)\ (s-b)\ (s-c)}$, in which the sides are a, b, and c, and the semiperimeter is s. Such a formula would not have been allowed by Euclid and his school, because it involves the product of four lines and could not therefore have represented a solid in three dimensions or a rectangle in two. In physics Heron showed great ingenuity, and he describes a large number of toys or models, some of which have since been utilized in a practical way. These include a steam engine and a force pump. He introduced into the schools more successfully than any of his predecessors the idea of applied mathematics, and it is possible that this may have had its influence in hastening the temporary decline of pure mathematics, even as a similar movement in America to-day may bring about such a result. It is more probable, however, that his attitude was that of the general spirit of the time, and that the hibernation of pure science was independent of his efforts.
D. E. S.

HERRAD. — Abbess of Odilienberg or Hohenburg (1167–1195), born of a noble family in Alsace. It is recorded of her that she promoted studies in the nunnery, and to this end wrote the *Hortus Deliciarum* (*Garden of Delights*), which, having found its way to the library at Strassburg, was there burnt in 1870. Extracts and copies of the illuminations which were in all probability the work of the abbess herself remain. The *Hortus Deliciarum* contained extracts from the Bible, church histories, church Fathers, philosophy, astronomy, geography, nature study, liberal arts, chronology, and poems and hymns to be sung by the nuns. The work was intended for the education of the novices. A few excerpts from pagan writings were also included. The illuminations cover a multitude of subjects to illustrate the text.

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HERZEGOVINA. — See Bosnia and Herzegovina.

HESSE-CASSEL. — See Germany, Education in.

HESSE, GRAND-DUCHY OF, EDUCATION IN. — See Germany, Education in.

HESSUS, HELIUS EOBANUS (1488–1540). — A German humanist, who was admitted to be-the best Latin poet of his time. He studied at the University of Erfurt, and became rector of the school of St. Severus. From 1517 to 1526 he was Professor of Poetry and Eloquence at the university, and was an important figure in the literary coterie at Erfurt. With Ulrich von Hutten he joined in the national movement which was associated with the Reformation, although he seemed to fear that the humanistic tendencies were being pushed on one side. For a short time, 1526–1533, he was rector of a school at Nuremberg. On his return to Erfurt he found that the university had practically ceased to exist before the rapid rise of Wittenberg. In 1536 he accepted a call to Marburg. Hessus was a prolific writer, and showed equal facility in all branches of verse. He translated the *Psalms*, *Ecclesiastes*, Theocritus' *Idylls* and Homer's *Iliad* into Latin, and in imitation of Ovid he wrote *Heroides*, or letters from holy women. He published collections of his writings as follows: *Operum Helii Eobani Hessi Farragines duæ*, and *Silvarum Libri IX* (containing the poetical description of Nuremberg, *Urbs Noriberga illustrata Carmine heroico*). Although recognized as a leader, Hessus never exercised much influence on contemporary movements. His life and letters were issued by his friend Camerarius in 1553.

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HEURISTIC METHOD. — The inductive method of modern science when applied to the teaching of children is called the heuristic method. The term is current in English pedagogy, "inductive method" being more frequently used among American teachers. The command, "never tell a child anything that he can find out for himself," expresses the essential attitude of those who believe in the heuristic or inductive method. It aims to place the learner in the position of a discoverer of truth, so that facts and generalizations will emerge in proper order and relation in the child's mind. Its extreme application implies that each child will experiment and observe for himself; thus the teaching of physics and chemistry may be conducted by means of individual experimentation in the laboratory, demonstration by the instructor being completely eliminated. In its pure form the heuristic method is seldom used. A modified inductive method that avoids dogmatic teaching without incurring the waste of an extreme heuristic mode of procedure is current among all progressive teachers in the elementary schools, taking such names as "inductive teaching," "developmental instruction," "laboratory method," and "indirect method." Such modifications of an extreme heuristic mode of teaching recognize two important pedagogical facts: (1) That the child learns best through his own activities, and (2) that the pupil may understand many facts without going through all of the detailed efforts and failures that have accompanied their original discovery. H. S.

See Direct Method; Developmental Methods; Inductive Method; Inventional Geometry; Socratic Method.

HEWETT, EDWIN CRAWFORD (1828–1905). — Normal school principal and educational writer; was graduated from the Bridgewater (Mass.) Normal School in 1852. He was an instructor in the Bridgewater Normal School, principal of a grammar school at Worcester, and for thirty-two years connected with the Illinois State Normal School; its principal from 1876 to 1900. He was active in the National Education Association; editor of the *Illinois Schoolmaster;* the author of a series of arithmetics, and of two books on education — *Pedagogy for Young Teachers* (1884) and *Elements of Psychology* (1889). W. S. M.

Reference: —

Cook, John W. *Edwin C. Hewett.* *Proc. N.E.A.* for 1905, pp. 335–340.

HEYNE, CHRISTIAN GOTTLOB (1729–1812). — One of the foremost classical scholars in Germany at the close of the eighteenth century, and a leader in the new humanistic movement of the period. The son of a poor weaver, Heyne underwent the greatest hardships to secure an education at school and at the University of Leipzig, where he came under the influence of Ernesti (*q.v.*) and Johann Friedrich Christ. For a time he managed to secure a livelihood as assistant librarian, and then as tutor, until in 1763. Though only known for editions of Tibullus and Epictetus, he was invited to succeed Gesner (*q.v.*) as Professor of Eloquence at the University of Göttingen. In this position he transformed the dry, formalistic study of the classics into a living, vital force, aiming at a true appreciation of the works of antiquity through a knowledge of history, antiquities, and archæology. Regarding the classics as the only method of approach to the good, the true, and the beautiful, Heyne wished in that way to influence the culture of his time. His influence was widespread, and from his philological seminar, the entrance requirements to which were rigorous and in which the students received government grants, there came many future university and school teachers, imbued with a new attitude towards the classics. But Heyne also had direct contact with the schools; as inspector of the school at Ilfeld he drew up new regulations in 1770 which reorganized the curriculum on a basis of Greek, and in

1798 he performed a similar work for the gymnasium at Göttingen. Besides his editions of Tibullus and Epictetus, Heyne published editions of Vergil, Pliny, Apollodorus, Pindar, Conon, and Parthenius and Homer's *Iliad;* in addition he wrote treatises and essays on a great variety of subjects collected in six volumes as *Opuscula Academica,* and numerous reviews in the Göttingen *Gelehrte Anzeigen,* of which he was the first editor.

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HICKOK, LAURENS PERSEUS (1799–1888). — Educational writer and college professor; graduated from Union College in 1820. He was for many years professor in the Western Reserve College and the Auburn Theological Seminary. From 1852 to 1869 he was professor in Union College, acting as president during the collegiate year 1867–1868. His published works include *Rational Psychology* (1849), *Moral Philosophy* (1853), *Empirical Psychology* (1854), *Logic of Reason* (1875), and several books on theology. W. S. M.

HIERONYMIANS. — See Brethren of the Common Life.

HIGBEE, ELNATHAN ELISHA (1839–1889). — State Superintendent of Schools in Pennsylvania; was graduated from the University of Vermont in 1849 and the Theological Seminary at Mercersburg, Pa., in 1852. He was instructor in academies at Woodstock, Vt., and Emmitsburg, Md., and was later professor in Heidelberg College and the Theological Seminary at Mercersburg, Pa. He was state superintendent of public instruction in Pennsylvania from 1881 to 1889, during which time he was also editor of the *Pennsylvania School Journal.* He was the author of numerous educational essays. W. S. M.

Reference: —

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HIGH SCHOOL. — The term "high" as applied to a school, which in these modern days in England has become almost synonymous with a high-class secondary school for girls and in America with a public secondary school, is one really of very great antiquity, as applied to a "public" school or grammar school. Originally of course high schools were exclusively for boys and youths, or young men, for females were not so much rigidly excluded as not contemplated by any one as admissible or seeking admission to the "general" or "public" grammar school. The term "high" was in common use in English for chief or principal, as in the word "High Street," which had no relation to steepness, or the Lord High Chancellor of England, *Summus cancellarius Anglie,* as distinguished from the Chancellor of the Exchequer, the King's chancellor, and not the chancellor of bishops or other inferior magnates. It was rendered in Latin indifferently by the words *summus* or *altus,* and possibly *generalis* and *magnus.* In connection with a school one of the earliest uses of it in England is an inquiry held at Winchester in October, 1373, in a suit between William of Wykeham, Bishop of Winchester, against the Master of the Hospital of St. Cross near the city for malversation of the revenues of the hospital. It was then given in evidence that among the hundred poor, who according to the foundation and ancient custom were every day entertained at dinner in the "Hundredmennehall" of the hospital were 13 poor scholars of the grammar school, sent by the master of the High Grammar School of the city (*magistrum summe scole gramaticalis civitatis Wyntonie*). The witnesses take this custom back in their own knowledge to 1313, and if it did not date to the actual foundation in 1130, it was at least not later than the secondary foundation or augmentation of the hospital in 1200. In a "Tarrage" or assessment of land in the city of Winchester, for the maintenance of its walls in the early part of the reign of Richard II, *c.* 1377, appears the item "From the High School" (*De alta scola*), 12*d.* and on the back is written "From the master of the High School" (*De magistro alte scole*), followed by a blank, apparently showing that he had not yet paid, and "From Sir John of the same place 6*d.*" The Sir means that John was a priest and probably usher of the school, who paid half its assessment. This school was the old city grammar school which was the subject of a lawsuit reported in John of Salisbury's letters about 1155, and no doubt the same as that to which Alfred the Great is said, in Asser's *Life* of him to have sent, *c.* 893, his younger Ethelward to learn Latin. This school continued after the foundation of the rival grammar school of Winchester College in 1382. For in January, 1407, we find in the Hall book of the college that the master teacher of the High School was at supper at the high table (*Magister Informator alte scole ad cenam in alta mensa*), *i.e.* having supper with the Warden and Fellows. In 1488 we find the Bishop's official granting license to one Furnew to "teach and inform in grammar and literature in the school of Winchester, called in the vulgar tongue 'The High Schole,' and forbidding any one else to teach school in Winchester, the master and scholars of the Blessed Mary's College, founded by the Lord Wykeham, only excepted."

The ancient cathedral or city grammar school at Exeter was also called the High School. The High Master of the city school (*summus magister scole civitatis*) was empowered by the statutes of Bishop Grandison on Nov. 18, 1332, completing the intended foundation of his predecessor Bishop Stapledon, the founder of Stapledon Hall, now Exeter College, at Oxford, to elect the twelve boys who were to be lodged and boarded in St. John's Hospital there under a tutor and to attend the city grammar school. In 1345 a new school and house for the master was built by Dean Richard de Braylegh. There is no specific evidence that it was called the high school until an entry in the Act Book of the chapter on Jan. 22, 1530, when the secundaries, clerks of the cathedral who served various altars while in training for the priesthood, had 6*d.* a quarter deducted from their salaries "for the stipend of the master of the High School (*altarum scolarum*) for teaching them." From then until the year 1759, when the school came to an end, and especially after the year 1632, when the endowed Free Grammar School, which finally killed it, was established, it was also generally called the High School, the new school being called the Grammar School, or the Free School. This Free Grammar School was established by the city in opposition to the dean and chapter and the bishop, chiefly because the old High School charged tuition fees in the hall of the church of the dissolved St. John's Hospital, under a patent obtained from Charles I in 1632. But as late as 1662 a medical doctor, Robert Vilvaia, who established four exhibitions for Exeter boys at Exeter College, Oxford, directed that two of them should be given to boys from "the High School," and two out of the Free Grammar School. The last master of the High School was appointed in 1739, and on his death it ceased.

At Lincoln in 1388 we find the cathedral or city Grammar School, called the High School. (*magnarum scolarum*), in an appointment of an usher or second master, in contradistinction to a new grammar school really established for the choristers, and in 1406 its superiority was recognized by the boys in the latter being obliged once a term to go down to the High School (*scolas generales*) and sit in it under the teaching and chastisement of its master.

In the nineteenth century there seems to have been a tendency to revive the title of high school, especially in Scotland, where the Edinburgh High School, a title appearing in town records of 1534, was accepted as the model. Thus the Glasgow Grammar School became the High School in 1834; the Sterling Grammar School became the High School in 1856; at Dundee an academy, grammar and another school were amalgamated into a high school in 1859. In England the title of the Nottingham Grammar School (f. 1513) was changed to High School in 1868; and in 1878 the Oxford High School for boys was founded.

In France the distinction was made between the High School, meaning the city or cathedral grammar school, and the lower schools in various parishes, the teaching in which was not allowed to go beyond the parts of speech. Thus in 1324 and 1325 the rector of the schools of St. John-en-Vallée and the schoolmaster of St. Andrew's Chartres were inhibited from teaching beyond the *Donat* (Donatus' *ars minor*), except in the High School (*scolis majoribus Carnotensibus*), and in 1358 a master is admitted not as usual primarily to "the School of Chartres" but as master of the High School (*magnarum scholarum*). So at Paris in 1380 there were some twenty-one *petites écoles* under the Precentor of Notre Dame giving elementary instruction, as contrasted with the High School, the *grande école*, the Grammar School under the chancellor.

In Germany the term high school, *Hochschule* or *Hohe Schule*, was taken up at the period of the Renaissance to designate emphatically the enlarged schools with their wider humanistic curriculum, which became almost universities, alike in number of students and in subjects, and were solely or largely under the management of the town authorities instead of that of the Church. At Vienna we hear of Johann Spieshammer at the end of the fifteenth century at the age of eighteen lecturing at the High School on Lucian, Sallust, and Cicero. The proposal for a High School at Strassburg in 1501 was intended to restrict itself to classics. The High School at Nuremberg was established by Melanchthon (*q.v.*) in 1526. The term received a sort of consecration from the famous school established by Sturm at Strassburg in 1536. From that time the term vied with gymnasium and the usual name for the highest form of classical school, the public school of England. (See HIGHER EDUCATION.)

It is not quite clear how the term came to be used in America for the same thing, when it had died or was dying out in England in the seventeenth century. It appears to be definitely established that the term was borrowed directly from the Edinburgh High School, where at the beginning of the last century Professor Pillans (*q.v.*) was experimenting with the monitorial system. At Boston the English Classical School became the English High School in 1824. The change may have been influenced by an article in the *North American Review* written by John Griscom (*q.v.*) on the work of the Edinburgh High School. Griscom also established a High School for Boys in New York, which was opened in 1825, although it was under consideration for one or two years before that date. The use of the term High School in Pennsylvania in colonial times does not seem to have any influence on its subsequent history. (See Brown, E. E., *Making of our Middle Schools*, pp. 303 ff., New York, 1905.) That it became acclimatized is certain, and it is quite certain that it was to the American use of the term that its revival in England was due when the new movement for the higher education of girls in schools similar to those of boys of the same class began in 1848 with the

Camden High School for girls, from whence it has been adapted all over England as the generic term for a girls' Public School. A. F. L.

HIGH SCHOOLS IN THE UNITED STATES. — History. — The first high school in the United States was established in Boston in May, 1821, as the Boys' Classical School, complementary to the Boys' Latin Grammar School. The term "high school" was not officially applied until 1824, and was not employed in the Massachusetts statutes until 1840. Meanwhile in 1826 a high school for girls was established in Boston. This school existed only for two years, not because of unpopularity, but the reverse. So large was the attendance that one school would not accommodate the applicants, and the upper grades of the common schools were expanded to meet the needs of the girls. The report of the committee in 1821 clearly indicates the situation which soon called for the establishment of this type of school all over the country: —

> "The mode of education now adopted, and the branches of knowledge that are taught at our English grammar schools are not sufficiently extensive nor otherwise calculated to bring the powers of the mind into operation nor to qualify a youth to fill usefully and respectably many of the stations, both public and private, in which he may be placed. A parent who wishes to give a child an education that shall fit him for active life, and shall serve as a foundation for eminence in his profession, whether mercantile or mechanical, is under the necessity of giving him a different education from any which our public schools can now furnish. Hence, many children are separated from their parents and sent to private academies in this vicinity, to acquire that instruction which cannot be obtained at the public seminaries."

The Latin grammar school was essentially a college preparatory school, and its curriculum was not suited to the common needs of life. The academy offered a curriculum of practical studies, but it was a private institution requiring considerable tuition fees, and it was, therefore, somewhat exclusive. A school was needed to provide three or four years of training beyond that given in the elementary schools, that should have a practical curriculum like that of the academy, and that should be free, like the Latin grammar school. (See GRAMMAR SCHOOL; ACADEMY.) Previous to the founding of the Boys' Classical School, twenty-six academies had been incorporated in Massachusetts.

In 1827 the first state high school law was passed, again in Massachusetts. This required such a school in every town of over 500 families. However, for many years the academy (*q.v.*) still continued to be the dominant secondary school, even in Massachusetts. In 1840 there were 114 incorporated academies in the state, and only 18 high schools, though strict compliance with the law of 1827 would have given 44. From this time on the number of high schools increased very rapidly. By 1861 the State Board of Education claimed that there were 102 high schools in the state, teaching Latin and Greek. There were no doubt at least one hundred well entitled to this claim, though recent official attempts to summarize the high school development in the United States credited no more than that number to the entire country, and only eleven to Massachusetts. By 1862 the system was well established in Massachusetts; although less than 70 per cent of the towns of the state met the legal requirement, even allowing the 102 schools claimed by the state board.

Meanwhile, the development of the high school had gone on elsewhere, though more tardily. In New York the conflict between the high school and the academy resulted even more favorably for the academy than in Massachusetts. While Governor Clinton during the decade 1817–1827 advocated the establishment of high schools in every county, under the monitorial system, and connected with the professional training of teachers, but few of these were founded. The friends of the academy were able to divert the appropriation of state funds to these institutions instead of to the high schools or the normal schools. The "Union Free Schools" Acts of 1853 and 1864 developed many high schools under local control out of the graded free school system.

After the Civil War period the number of high schools increased very rapidly. In 1880, according to the *Report* of the United States Commissioner of Education, there were 800; in 1890, 2526; in 1900, 6005; and in 1910, 10,213. In a little less than one third of these schools there are not more than three teachers; in more than one third, not more than six teachers; in about two thirds, not more than ten teachers. In some of the largest city schools there are as many as 125 teachers and 3000 pupils. The recognized standard high school course is now four years in length, but many schools have a one, two, or three years' course. (See the articles on the separate state systems for the development of their high schools.)

State Systems. — The high school of the United States has, upon the whole, evolved from the free elementary school. Its development has followed that of its progenitor by approximately a quarter of a century, so that in many states it remains as yet almost entirely unsystematized, so far as the legal aspect is concerned. In a number of states, only the most general legal provision is made for the establishment and maintenance of such schools, while in a few of the Southern and in at least one of the Northern States, New Jersey, no special legal provision is made for them, such schools as exist being considered merely as the higher grades of the public schools. Most of the states have, however, made definite legal provision for these schools, and a large number, such as Maine, Massachusetts, New York, Indiana, Wisconsin, Minnesota, and California, have evolved comprehensive independent laws governing the establishment, maintenance, and management of such schools. But the legal provisions even of these states differ widely among themselves, so that the laws governing this institution in the United States range from indefinite and badly defined codes in certain states to clear and specific legislation in others.

Nevertheless the high schools in the various states have a remarkable resemblance in external and internal management and control, as well as in their curricula. In general no greater differences exist internally between the high schools of Maine and those of California than may be found to exist between the different high schools of any given commonwealth. This similarity is due to a number of factors in American life and American educational practices. In the first place, the elementary schools, the feeders of the high schools, resemble one another even more closely than do the high schools. The colleges, the universities, and particularly the state universities, the institutions that largely receive the output of the high schools, also closely resemble one another.

The explanation of this close resemblance of the various types of schools in the American system of education is largely due to imitation brought about by the following facts and conditions: (1) most of the states of the Union are relatively new and their populations have been largely recruited from the other older states; (2) the Americans are a migrating people, and recognize no state boundaries in their shifting from place to place; (3) there is wide communication through travel, books, and periodicals; (4) national and state conventions of teachers, principals, and superintendents are held annually, — the state conventions usually employing outside instructors to present the work; (5) teachers are to a considerable extent recruited from the country at large rather than from the local community and state alone; (6) students frequently leave their own communities and state to prepare for their work of teaching. In addition the laws governing the establishment, maintenance, and support of all of these types of schools have been more or less influenced by the laws and practices of other states.

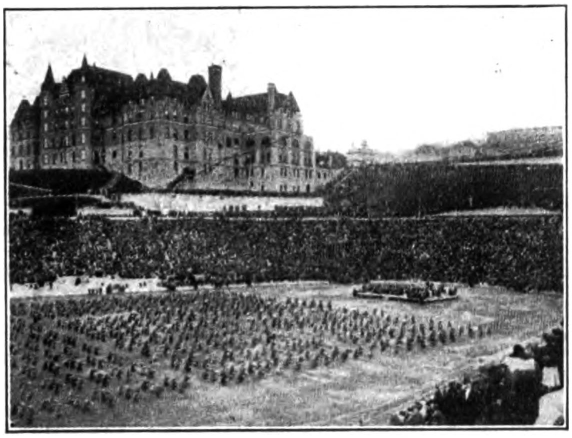
In no point, however, do the high schools of the Union so closely resemble each other as in their curricula. This is due to the fact that this institution has been, and is to-day, fundamentally a preparatory school to the colleges and universities, which by association and concerted action have set a more or less definite standard of requirement for entrance, and thus to a large degree have dictated a common curriculum for these schools. (See College Requirements for Admission.)

Ever since the rise of the high school in this country its ablest advocates have dreamed of it as the finishing college of the common people; but as yet the fruition of this dream has not been accomplished, — unless, indeed, the college preparatory course can be considered the best preparation for social efficiency. This condition has been no more the fault of the college and the university than of those who have insisted upon a different curriculum, but who in the past have been unable to evolve one definite enough to be workable in any of the thousands of high schools of the country. However, the present widespread interest in vocational, industrial, technical, commercial, and economic training, and the growing interest in the refinement of the other common aspects of life, together with the practical experiments now going on, give a renewed promise for the future of this dream of a people's college. The American high school, then, in so far as it is efficient, owes this efficiency in large measure to the college and the university.

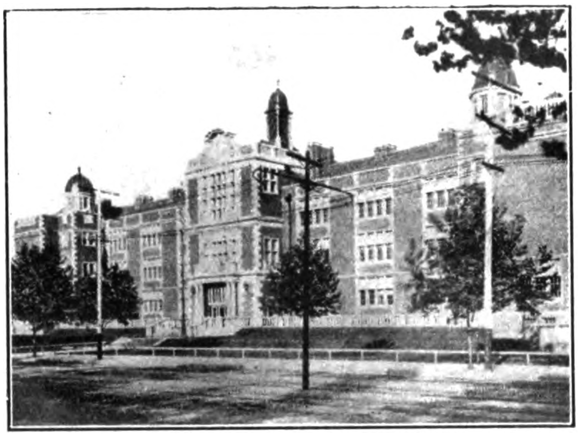
The systematizing of any series of schools of a given type means their unification; and this can be secured only through the operation of one or more of the four following instrumentalities: similar laws governing their establishment, maintenance, and support; like curricula; supervision and inspection; and teachers with similar ideals and training. The first of these will be discussed later.

Inspection. — With a few notable exceptions, the only state-wide supervision and inspection that American high schools have received in the past has been upon the motion and at the expense of the state universities, sometimes with, and sometimes without, legal warrant from the state. This inspection, to be sure, has been solely in their own interests, but it has nevertheless tended to systematize these schools not only within the state, but likewise within the country at large. (See Accredited Schools; Accredited Teachers.) As stated elsewhere, these same universities have also unified the curricula of these schools, and through their instrumentality as preparatory schools for high school teachers they have instilled into them similar ideals and have provided them, largely through imitation, with similar methods of procedure in instruction. A few states, however, such as Massachusetts, New York, New Jersey, Wisconsin, and Minnesota, provide in other ways for supervision and inspection. In both Wisconsin and Minnesota the responsibility for high school inspection rests only partly with the state university authorities. In New York, New Jersey, and Massachusetts it is independently conducted. It is worthy of note that all of these states mentioned above give direct financial aid to the least wealthy high school districts. State supervision or inspection, legal requirements governing curricula, and qualifications of teachers, all inevitably follow state financial aid to high schools.

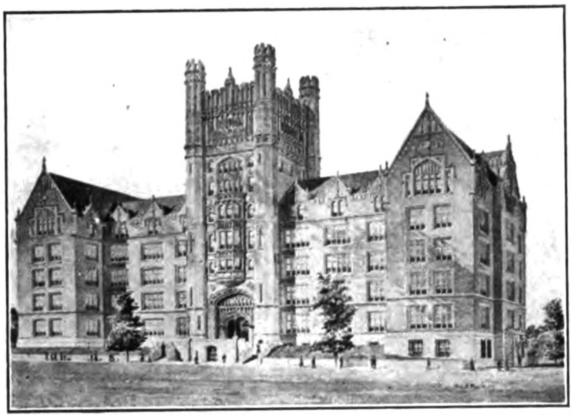
Organization of Control. — The most prevalent local political unit of organization for the establishment, maintenance, control, and



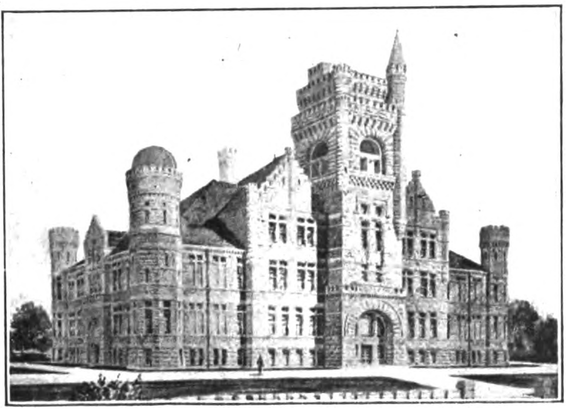
Tacoma, Wash., High School (with stadium).



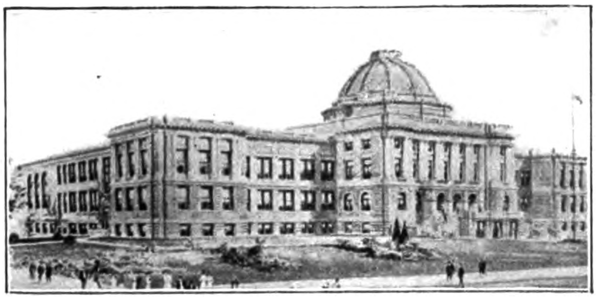
F. Louis Soldan High School, St. Louis.



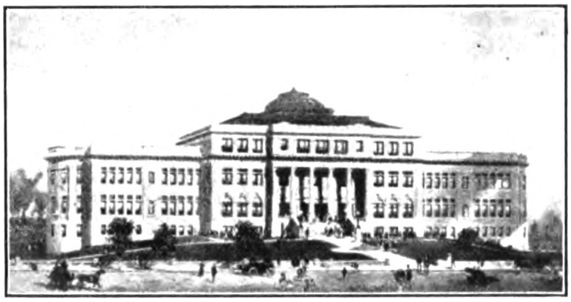
Morris High School, New York City.



Sioux City, Iowa, High School.



Springfield, Ohio, High School.



Pueblo High School.

Typical High School Buildings.

support of high schools in the United States is the district, which includes the city or parts of the city, the town or small city, the village, the rural district, or a union of such districts. This system prevails in all of the states in so far as it applies to the cities and larger towns, and in some states it is the only unit of organization for the establishment of such schools. In most instances the local board of school directors or school trustees, which also has charge of the local lower schools, controls these schools. (See CITY SCHOOL ADMINISTRATION.)

In the rural districts of many of the Eastern and Middle Western states the township unit of organization prevails both for elementary and for high school purposes. In certain of these states the district unit of organization prevails for elementary school purposes, while the township unit prevails for high school purposes. In most of them there are also union or joint township high schools in existence. The boards of education which are in control of these schools are elected by the people of the territorial districts maintaining them. In some of the Southern, Western, Rocky Mountain, and Pacific Coast states many county high schools exist, and in at least a few cases joint county high schools. These schools are always under the control either of the county boards of education, which have other duties relating to the elementary schools, or of special county or joint county high school boards. In a few states these boards are appointed by the county courts, in others by the county commissioners or supervisors, and in the remainder of the cases they are elected by the people.

E. R. S.

Rural High Schools. — Since in general the towns and villages of the United States with populations to exceed 2500 are able to maintain reputable high schools, and since they have for years been doing so, the main problem of rural secondary education has to do mostly with that part of the population residing in the smaller villages and on the farms of the country. The units of organization for rural high school purposes vary widely in the different sections of the country as well as in some of the states themselves, the smallest of these units being the district. These district high schools, in so far as they may be classed as rural, have largely grown out of the elementary schools through the gradual addition of high school subjects and high school grades. This is particularly true in such states as have had the district unit of organization and control in matters of education. In every state where the unit of control is such, and where the law has failed to define the public school as a strictly elementary school, rural high schools have grown up as district schools. The union of districts for high school purposes is also an outgrowth of the gradual extension of the elementary school. As a type it is the result of combining two or more advanced district schools that had already developed considerable high school work in connection with their elementary courses. The township unit of organization is more prevalent than the district unit, in so far as the term applies to such rural high schools as have state recognition as such. This is a perfectly natural condition, since in most of the older and wealthier states, the Eastern and Middle Western groups, the township constitutes the unit of taxation and organization for public school as well as other civil purposes. The method of uniting townships into high school districts has also been employed to a considerable extent, particularly where the townships covered a small area, or where their most thickly populated areas were adjacent. The county plan of organization is quite largely practiced in the Western and in certain of the Southern states. This plan of organization almost always implies large local support, and is especially adaptable to thinly populated districts. Village and town districts sometimes unite with their counties or with their own townships or with a group of adjacent townships in the establishment and maintenance of union high schools. In fact, in a large number of the states any combination of territory may organize itself into a high school district.

Curriculum. — The courses of study in the rural high schools are very similar to those of the city high schools in the states wherein they are located. The most notable difference is that they offer a smaller number of courses, which is a direct result of the small teaching force employed and of the small number of pupils in attendance. Most of the states, recognizing that these schools are at least in theory finishing institutions, have required one course of instruction other than the classical, making the foreign languages elective, if offered at all. In most cases, however, these schools give also a college preparatory course, including at least one foreign language, usually Latin, though the modern languages are rapidly gaining ground.

The present tendency is to create for these schools courses of a more practical nature. This is to be accomplished by modifying the courses and instruction in the sciences, by adding courses in agriculture, stock-raising, dairying, horticulture, and other practical subjects, as demanded by the particular school. So far little of a practical nature has been accomplished in this line. In fact, in regard to practical education, the cities are at the present time far in advance of the rural districts. Some of the Middle Western states, such as Wisconsin, Michigan, and Nebraska, have made considerable progress in this line.

Another tendency worthy of note is that of recognizing and aiding rural high schools which offer only a partial course of study, particularly the two-year rural and small village high school. Such schools are becoming common in the upper Mississippi Valley, though as yet only a few states have granted them any special financial encouragement. California, with its two-year "Grammar-High" schools (*q.v.*), is a notable exception in this particular. (See also HIGH SCHOOLS, SUPPORT OF.)

Statistical Summary. — A statistical statement of the number and condition of the strictly rural high schools in this country is not possible, because, as pointed out above, the statistics of rural high schools proper are combined with those of all villages and towns having populations that do not exceed 8000 inhabitants. The increase in the number of reputable non-urban high schools is a good index to the vitality of the institution at the present time.

The following statistical summary is based on an extended study of twenty states selected because of their availability for the purpose. These were Maine, Massachusetts, New Jersey, California, Colorado, Washington, Connecticut, Vermont, New Hampshire, Michigan, Wisconsin, Minnesota, Ohio, Indiana, Illinois, Iowa, Missouri, Texas, Kansas, and Nebraska. The high school and other necessary statistics for these states for the nine years ending 1906 were compiled, and interpreted with the following general results: —

(1) The average increase in the number of rural[1] high schools in the twenty states was, for the nine-year period, 50 per cent. (2) The average relative[2] increase in the enrollment of pupils in the urban[3] high schools of the twenty states was, for the nine years, 46 per cent, while for the non-urban[1] high schools it was, for the same period, 65 per cent. (3) The average increase to the school in the number of teachers employed in non-urban high schools was, for the nine years, more than 19 per cent. (4) The average decrease in the relative number of one-teacher high schools was, for the nine years, more than 11 per cent. (5) The average decrease to the school in the relative number of two-teacher high schools was, for the nine years, more than 33 per cent.

The general methods employed by different states in extending financial aid to rural secondary education are varied, and are discussed in the section on SUPPORT OF HIGH SCHOOLS.

The influence of this aid upon the rural high schools of these states is clearly shown by the following comparison of the average development of rural secondary education during a period of nine years, 1897–1906, in six states, Minnesota, California, Massachusetts, Washington, Wisconsin, and Maine, — all of which provided state subsidies to rural high schools and two of which also provided for the reimbursement of tuitions, — with the average development of rural secondary education during the same period in eleven states, Nebraska, Ohio, Indiana, Kansas, Colorado, Michigan, Illinois, New Jersey, Iowa, Missouri, and Texas, none of which provided direct state aid to secondary education in any manner whatever. The results were as follows: —

(1) The average increase in the number of non-urban high schools was, for the six states, 68 per cent, for the eleven states, 48 per cent. (2) The average increase in the number of teachers employed to the school in non-urban districts was, for the six states, 38 per cent, reckoned on an average status of 2.4 teachers to the school in 1897; for the eleven states 6.5 per cent, reckoned upon an average status of 2.5 teachers to the school in 1897. (3) During these nine years the average relative proportion (.25) of one-teacher high schools in the six states was reduced 63 per cent; in the eleven states the average relative proportion (.27) was increased 15 per cent. (4) During the same period the average relative proportion (.52) of two-teacher high schools in the six states was reduced 53 per cent, while in the eleven states the average relative proportion (.44) was increased 2 per cent. (5) The average status of enrollment of pupils in all types of secondary schools, 4.44 individuals to each 100 of census (5–18), in the six states in 1897 was increased during the nine years 57 per cent, while in the eleven states the average status of enrollment, 3.68 individuals to each 100 of census (5–18), was increased but 39 per cent. (6) The average status of enrollment of pupils in city high schools, 4.81 individuals to each 100 of census (5–18), in the six states in 1897, was increased during the nine years 52 per cent, while in the eleven states the average status of enrollment, 4.13 individuals to each one hundred of census (5–18), was increased 49 per cent. (7) The average status of enrollment of pupils in non-urban high schools, 2.85 individuals to each 100 of census (5–18), in the six states in 1897 was increased during the nine years 100 per cent, while in the eleven states the average status of enrollment, 2.49 individuals to each 100 of census (5–18), was increased 49 per cent.

Thus it appears that the rapidly developing standard of rural secondary education in the states that provide special financial aid is slowly approaching the increasing standard of the same in the cities of these states. On the other hand, it appears that the rapidly increasing standard of rural secondary education in the states that offer no special aid is slowly diverging from the constantly increasing standard of the same in the cities of these states. On the whole the general increase of standard of urban as well as non-urban secondary education has been very rapid in recent years. E. R. S.

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[1] All high schools not located in cities with a population to exceed 8,000 inhabitants.

[2] Enrollment for each year compared to census, five to eighteen years.

[3] High schools in cities with 8,000 or more inhabitants.

The Curriculum. — When the American high school first arose, and during what may well be termed the period of its struggle for existence, the need of higher education for any large percentage of our people was relatively slight. With an elementary school system of very meager proportions still in its infancy; with the principle of general taxation for education scarcely established; with little surplus national wealth; with few of the pressing problems of government, industry, and human relations, with which we of to-day are so familiar, not as yet markedly in evidence; and with but a small portion of our present organized knowledge as yet available for purposes of instruction: it can readily be understood that the high school of the earlier period was very limited in its scope, and was demanded by but a very small percentage of the people. Latin, Greek, and mathematics constituted the backbone and the bulk of all instruction; the course of study was the same for all; and the school was useful chiefly as a preparation for entering some one of the denominational colleges of the time.

The past fifty years, however, have witnessed very great and very significant changes in every feature of our national life, and the public secondary school has shared in these changes. Everywhere such schools have been adopted as a necessary part of a system of popular education, new classes of people have been attracted to them, and new subjects of instruction have been provided. The development of the secondary school since 1890, and particularly since 1900, has been marked. With the gradual evolution of the new conceptions as to the purpose and function of public education, there has been a gradually increasing demand that the secondary schools shall more thoroughly meet the needs of the new classes in the population which have turned to them for help and enlightenment. This has greatly changed the nature of high school work.

First to be introduced was history and English literature, and then the modern languages. In the seventies and eighties came the sciences, first in book form and shortly afterward as laboratory studies. Manual training and domestic arts came to be recognized as teaching subjects for special schools in the late eighties, and have since been incorporated as parts of regular high school instruction. Business training, at first introduced as a concession to public opinion and to meet the competition of the private "business colleges," has since been adopted as a useful addition, and, in the larger city high schools, is being transformed into good, strong, commercial or business courses. (See COMMERCIAL EDUCATION.) Still more recently agriculture has been admitted as a useful subject of instruction, and the development of the agricultural high school has been very rapid. (See AGRICULTURAL EDUCATION.)

These many additions have affected the high school curriculum in two ways: (1) the old course has been expanded and crowded, resulting in the introduction both of elective studies and elective courses; and (2) new types of high schools have arisen by the side of the old to minister to the new needs. These changes may be illustrated by a few typical examples of high school curricula, chosen from different types of American high schools, and by an enumeration of the different types of high schools which have been formed.

Types of High School Curricula. — I. A small New England high school, in which the one fixed, traditional course of study, almost entirely based on book work, has had to give way to changing demands and admit a few electives during the last two years. This type of school is still very common in conservative communities and among rural high schools.

FIRST YEAR	THIRD YEAR
English Composition and Literature	English Literature
Ancient History	Modern English History
Latin	Latin (or German)
Algebra	Physics (or Bookkeeping and Business Arithmetic)

SECOND YEAR	FOURTH YEAR
English Composition and Literature	English Literature
Medieval History	American History and Government
Latin	Latin (or German)
Geometry	Chemistry (or Typewriting and Shorthand)

II. A medium-sized city high school, located in the Mississippi Valley. Here, by combinations, five different courses of instruction have been arranged, supposedly to fit different types of individuals. Such combinations are quite common, though the tendency is to decrease the number of required subjects and to increase the number of electives in each. In the administration of the school this is usually done in individual cases, though not indicated in the paper courses of study.

I. ANCIENT CLASSICAL COURSE	II. MODERN LANGUAGE COURSE	III. HISTORY-ENGLISH COURSE
First Year,	First Year,	First Year,
Latin	German	Latin or German
Ancient History	Ancient History	Ancient History
English	English	English
Algebra	Algebra	Algebra
Second Year,	Second Year,	Second Year,
Latin	German	Latin or German
Greek	Medieval History	Medieval History
English	English	English
Geometry	Geometry	Geometry
Third Year,	Third Year,	Third Year,
Latin	French (or Spanish)	Modern History
Greek	Modern History	English
English	English	Physics
Physics	Physics	Drawing
Fourth Year,	Fourth Year,	Fourth Year,
Latin	French (or Spanish)	American History and Government
Greek	American History and Government	English
English	English	(Elective)
(Elective)	(Elective)	(Elective)

IV. Scientific Course	V. Business Course
First Year, German Botany English Algebra	**First Year,** (any other course)
Second Year, German Zoölogy English Geometry	**Second Year,** (any other course)
Third Year, Physics Drawing Trigonometry (Elective)	**Third Year,** Spanish Business Arithmetic Bookkeeping Typewriting
Fourth Year, Chemistry Drawing American History and Government (Elective)	**Fourth Year,** Spanish Business Practice (Commercial Geography) (Commercial Law) (Shorthand)

III. A large city high school, located in the West, where fixed courses have been abandoned. The school offers a wide range of subjects, requires certain fixed units by groups, and makes up a different course of study for each high school pupil. The following studies are offered, the numbers in parenthesis following each indicating the number of years of each subject offered by the school.

Group I. — Languages

Latin (4)
Greek (3)
German (4)
French (2)
Spanish (2)

Group II. — English

English Composition (2)
English Literature (4)
Hist. Eng. & Am. Lit. (1)

Group III. — History

Ancient History (1)
Medieval History (1)
Modern English History (1)
General World History (1)
Am. Hist. & Govt. (1)

Group IV. — Mathematics

Algebra (1, 1½)
Geometry (1, 1½)
Trigonometry (½)
Surveying (½)
Business Arithmetic (½)

Group V. — Science

Botany (1)
Zoölogy (1)
Biology (1)
Physical Geography (1)
Physics (1)
Chemistry (1)
Geology (½)
Astronomy (½)

Group VI. — Miscellaneous.

Music (2)
Freehand Drawing (2)
Vocal Expression (2)
Physical Training (4)

Group VII. — Vocational

Mechanical and Geometrical Drawing (2)
Manual Training (3)
Domestic Science (2)
Household Management (1)
Bookkeeping (1)
Business Practice (1)
Shorthand (1)
Typewriting (1)

Rules governing combinations and graduation: (1) Students, to graduate, must complete 15 years' work, viz., four studies each year for three years, and three studies one year. (2) Students may, on permission, take as many as five studies or as few as three studies each half-year. (3) Students, to graduate, must have had two years' work in groups I and II, one year's work in each of the other groups, and four years' work in some one group. (4) Study cards must be made out each half-year, and must be approved by the principal and the parent.

The three types of high school courses given above illustrate the development which has taken place, and the tendency. Excepting agriculture, all new forms of instruction are represented in the one school. The advantages to the pupil are evident, while it is clear that such grouping of courses to meet individual needs as is provided for in the third type has advantages over that provided in the second type.

In some cities high school development has taken a different direction, and instead of expanding the high school to meet the many different needs, new types of high schools have been founded, and type or class high schools have resulted. There are to-day, in different places, the following different types of secondary schools.

(1) The so-called cultural or general high school; offering courses in the languages, literature, history, mathematics, and some science. This is distinctively a college preparatory high school. (2) The manual training (*q.v.*) high school; offering courses in science, mathematics, modern languages and history, English, and shopwork. This is preparatory for the engineering colleges, and work in shops and trades. It often includes the third type, for girls. (3) The household arts (*q.v.*) school. While usually included under the manual training school, a few such are being established separately. It offers courses in English, history, the sciences, and subjects relating to household management, and is a technical school for women's work. (4) The commercial high school. (See COMMERCIAL EDUCATION.) This is an intensification of the commercial course, and offers good courses in modern languages, history, science, and office practice. It is preparatory for commercial pursuits, on a larger scale than the old business course. (5) The agricultural high school. (See AGRICULTURAL EDUCATION.) This offers courses in English, mathematics, sciences, some manual training and household science, and agricultural studies. It is preparatory for farm life, or for the colleges of agriculture.

It is desirable both that these different types of high schools should exist separately in some cases, and in many other cases should be combined in one. In their beginnings all new types of schools usually prosper better if provided for separately; but, after these new schools have established themselves and their work has been accepted as a good and legitimate educational effort, it is wise then to combine a number of such types in one school, and thus offer a larger range of choice to each high school pupil. The American high school, if it is to realize its highest educational purpose, should be preëminently a place for the testing of capacity, the development of tastes, and the opening up of vocational opportunities of many kinds. This involves intelligent oversight and direction on the part of teachers and principals, a rich and varied curriculum from which to select, and freedom from hard and fast prescriptions. E. P. C.

See also articles on various subjects of the curriculum, *e.g.* LANGUAGE, ENGLISH; LITERATURE, ENGLISH; GEOGRAPHY; HISTORY; GREEK; LATIN, etc.

The Elective System of Secondary Schools. — In the course of its evolution, the high school has developed an extensive program of studies, — four or five foreign languages; English for every grade; mathematics for three or more years; two, three, or four sciences; history for two or more grades; and, in addition, manual and commercial subjects. These have contributed to the making of a program far too extensive to be within the reach of any one pupil. For a time with the introduction of new subjects, less and less time was assigned to each, with the result that when the *Report of the Committee of Ten* (*q.v.*) was written, many large high schools were giving twelve and fourteen weeks' courses in science, short courses in history, and smatterings of three or more foreign tongues. The *Report of the Committee of Ten* greatly emphasized the desirability of an intensive treatment in the high school of relatively few subjects. The effect of this *Report* was only rarely the complete elimination of any subject from the high school, but generally resulted in a tendency to intensify and extend the treatment of each one. More than ever did it become necessary that the individual student should take but a part, and frequently a small part, of the entire range of subjects open to him. Another tendency contributing to the flexible course of study was the increasing range of capacity and interest found in the students of the high school. A variety of studies in science, drawing, commercial branches, and manual training were introduced to meet these demands. A third element in the development of the flexible course grew out of the conception in the *Report of the Committee of Ten* that it was of less importance what particular studies were pursued than what was the method employed in teaching them. From the standpoint of the majority of the Committee, each secondary school subject was assumed to have equal value with any other, if properly taught. It was, therefore, natural to assume, if a pupil manifested a strong aversion to Latin or mathematics, that some other equally well taught subject could be substituted. (See FORMAL DISCIPLINE.)

Not long after the appearance of the *Report*, students of education began actively to question certain fundamental assumptions implicit in it, and particularly the disciplinary conception advocated by the Committee. It was commonly asserted that Latin, better than any other subject, trained faculties of observation, verbal discrimination, powers of analytical thinking, etc. Equally, it was claimed that the study of mathematics strengthened reasoning powers and greatly improved the capacity for systematic generalization. A series of critical articles, as well as certain investigations in psychological laboratories, tended during the last decade of the nineteenth century to unsettle existing preconceptions regarding mental discipline; in fact, there developed a tendency to assert that mental training should be a secondary consideration in the teaching of any subject, and that the subject itself should involve a content of knowledge or other power-producing material which should justify it and that, in the course of its presentation, mental training would follow as an accompaniment.

Finally, in recent educational theory there has grown up an increased belief in the wisdom of adapting education to the individual. This represents a considerable departure from an older theory of education, that the individual should be fitted to a given field of subject matter. This change came about, partly, from the causes already presented. It was found that not only the interests, but the needs and capacities of secondary school pupils vary greatly. Furthermore, it was found that the important end of education was to prepare individuals for some field of activity wherein that which was learned in the high school would find application, either as culture or vocational power.

The foregoing influences resulted in the development of the so-called elective system. It is true that, from its beginnings in the academy, the secondary school program had been somewhat elastic, but its elasticity had assumed the form of alternative courses, each course, however, representing a fixed and unvarying demand on the pupil. Naturally, alternative courses varied mainly in their demands for foreign language and for science; English and mathematics were usually prescribed subjects.

The elective system, however, carried the matter of alternative subjects to the point of allowing each pupil, within the limits of the range of subjects presented by the school and the other inherent restrictions of program, substantially to make up his own course. From the standpoint of the school or the pupil, the important consideration was not always so much the subjects which could be taken as those which could be omitted. During the last years of the nineteenth century and the first decade of the twentieth, the literature of secondary education was filled with discussions of the elective system. It was felt by some that it represented a demoralizing tendency in that it weakened the educational conception of discipline through the more difficult subjects. Educational conservatives feared that it meant a persistent discounting of classics and mathematics. They apprehended a rapid development of the more vocational studies, and denied that the individual pupil had any capacity for self-direction in the choice of a program of studies. They asserted that, from the standpoint of the best development of the individual, it was highly important that certain fields of culture should be opened to him, even by compulsory methods. In only a few schools did the theory of free election of subjects make much progress. In these instances the graduation of the pupil was made to depend upon the accomplishment of a certain number of units of work, but without reference to any specific subjects. He might omit history or mathematics, no less than a foreign language or a branch of science. More commonly the system took the form of a certain number of prescribed studies, with a considerable range of alternatives or options from which the pupil could choose. In the case of some large high schools, for the requirement of specific subjects, there was substituted the demand that, for graduation, a minimum number of units of accomplishment in foreign language, science, history, etc., should be presented, the pupil, however, retaining the privilege of electing among the various subjects in science or history as the case might be.

As a rule, few of the apprehended evils of the elective system have developed in practice. There has been an increased tendency to induce the pupil to make his selections not only with the approval of some advisory teacher, but of parents as well. The limitations of the school curriculum, even in the larger schools, have acted as an important barrier to free election. Furthermore, the fact that a considerable number of students anticipate entering college where the entrance requirements are more or less prescribed has prevented anything like a free use of possible electives.

While the tendency is still to extend the possibilities of election of secondary school subjects, it is nevertheless true that important underlying problems must be solved before an adequate discussion of election is possible. There yet exists no satisfactory theory regarding educational values, especially of secondary school subjects. Quite universally, for example, alegbra and geometry are prescribed for both boys and girls in secondary schools. Neither experience nor the tests of educational laboratories serve yet to demonstrate the superior value of these subjects. The same may be said to be true of the foreign languages so far as their training value is concerned. The science subjects have undergone steady modification in modern education, becoming more formal and rigid. There is yet no satisfactory evidence that, as now taught, these sciences contribute in an important way to either culture or practical capacity in greater degree than other possible subjects.

In prescribed programs it is the tendency to require subjects such as foreign language, mathematics, and science, which are most fully organized and which lend themselves most satisfactorily to traditional methods of pedagogic treatment. Until, however, there exists more satisfactory knowledge regarding educational values, it will be difficult to treat the subject of the elective system with anything like finality. It can be easily seen that the arguments for and against election hinge upon the theory of educational values and the capacity of a school to effect individual programs adapted to the various pupils. If we believe that a limited number of well organized secondary school subjects give either practical capacity, cultural insight, or mental training to be equaled in no other way, then it is a fair assumption that the school program should make these subjects prescriptive. There is little place for election, since the self-knowledge of the pupil and the experience of his parents are altogether insufficient to offset the results of the constructive effort which has gone to the making of the programs. If, on the other hand, we are inclined to believe that the educational values of certain subjects have been greatly exaggerated, and that what the pupil shall study is of less importance than his interest in the subject and the methods employed in teaching it, then it can easily be seen that satisfactory arguments can be made for allowing a part selection on the part of the pupil himself.

Other factors naturally enter into the discussion. Freedom of election means, naturally, that popular teachers will be sought and unpopular ones avoided, — a result which may tend to demoralize administration, and may or may not tend to promote more effective pedagogical methods on the part of the teachers themselves. It is believed that free election would tend to promote the study of practical subjects, at the expense of the more cultural, but again the relative educational values of the two types will be disputed. It is highly probable that a more extended analysis of the subject of election will have to wait a fuller and more scientific formulation of educational theory, as applied to secondary school studies.

There are many reasons for believing that the high school as at present organized contributes certain types of definite training more effectively than it develops culture and appreciation. On the other hand, the greatest deficiency of existing high school programs seems to be their incapacity to produce results of a persistent nature; for example, the study of a foreign language or of mathematics, even when well carried on, fails largely in the face of later demands; the general goal aimed at is not realized. Distinctions will have to be made among various high school studies, with a view to determining the specific principles or purpose which each should serve in a program of fairly well defined educational ends, and in adapting to each subject its own suitable method. This may be illustrated in the case of English. One object of the teaching of English in the high schools is undoubtedly efficiency of expression, both oral and written. Another object, however, and quite distinct from the above, is appreciation of good literature. It seems highly probable that these two ends will have to be attained by radically different methods. The same distinction will apply to certain of the sciences, when pursued from the standpoint of application in vocation on the one hand, or service in general culture on the other.

The general discussion of the elective system has probably greatly promoted interest in the problems of educational values. It brought subjects into competition, as it were, in a definite way. Until, however, more knowledge is available, many educators will assume that the choices made by the pupil, even when dictated by whim and caprice, may, and, so far as he is concerned, will be no worse than the choice made by a more or less inflexible system which not only fails to take account of him as an individual, but which, to a large extent, has had its origin independently of the study of any group whatever of actual living individuals.

Six Years' Course of Study. — The fact that the American secondary school, unlike similar schools in Europe, takes the pupil at fourteen, or on the completion of an elementary course extending over eight years, is to a certain extent one of the effects of the historical development of American education. The common school or the elementary school was first established, and, in order to accomplish a full measure of general education, it involved eight or nine, and sometimes ten grades, each a year in length. The typical American elementary school of to-day consists of eight grades, and carries the average pupil from the age of six to the age of fourteen. The first secondary schools — the Latin-grammar school and then the academy — partook something of the character of European secondary schools, in that they maintained preparatory classes in which attention was early given to some secondary school studies. The public high school, however, was almost universally designed to succeed the elementary school course, and to build on it. As a consequence, admission to the high school everywhere requires the completion of an eight-year elementary course, and brings the pupil in at approximately fourteen or fifteen years of age.

This situation has obvious defects. It cannot be insisted, of course, that all American children, or even any considerable number of them, should complete the high school course of study. For those who do, however, the postponement of the beginning of foreign language study, as well as of algebra and geometry, works undoubted harm. For the boy who is to go through high school and into college, there can be little doubt but that the years between twelve and fourteen under the present system of schooling are largely wasted, at least, when viewed from the standpoint of the mastery of particular studies which should assist in the higher schools. The attention given to this subject in recent years has led to a fairly widespread demand for a six-year course of study in the high school, which should take pupils at approximately the age which is becoming customary in some European countries, and which especially should aid them to begin the study of foreign language at a time when the vocal and auditory organs are still plastic. The administrative difficulties have been so great, however, that only in rare instances has the experiment been tried. The chief difficulty is found in the unwillingness of the American people to permit either a differentiation of schools or a differentiation of classes of studies before the elementary school course has been completed. On the other hand, there is little tolerance for the prescription of foreign language study for all pupils in the upper grades of the elementary school. The result has been that, while a considerable literature has been produced bearing on the desirability of extending high school studies and high school methods downward, very little of a practical nature has been accomplished.

The problem is now being approached in some cities in a different way. It is recognized that the boys and girls from twelve to fourteen years of age possess certain distinctive characteristics and educational needs, which should separate them from the primary school which has preceded. In not a few cities it is now customary to group the upper grades in what are sometimes called intermediate schools where favorable opportunities may be given for manual training, domestic science for girls, commercial studies, and, in a few instances, foreign language. While few of these schools have reached the point of differentiating their courses, there can be no doubt that in a large number of instances they are ready to do so, if public opinion responds favorably. One of these schools in a Massachusetts city (Fitchburg) now receives pupils on the completion of the sixth grade, and admits them to any one of four courses. Certain studies, such as English, history, geography, and music are common for all, and are taken jointly in the classes. Certain other studies are alternative, and it is on the basis of these that the courses are distinguished. For example, boys who wish it may take two hours of manual training per day, and thereby become members of the industrial arts course; for them the arithmetic and drawing will also be somewhat specialized along the lines of the industrial arts. Another group of boys and girls, instead of manual arts, may take a foreign language, the beginnings of algebra, geometry, and English history. This is obviously a high school preparatory course, and may legitimately be regarded as part of a six years' high school course, which it is hoped in time may become five years in length, thus admitting pupils to college one year earlier. A third course offers to girls two hours per day of household arts, the subject being treated very broadly, with related history and science. A fourth course, known as the commercial course, offers opportunities in typewriting, commercial arithmetic, the beginnings of bookkeeping, and a line of work wherein commercial geography and industrial history are combined.

It is not intended that any of the above courses shall be vocational, but that some of them shall draw from the world of vocational activities studies and problems that are significant and vital to the pupils concerned. Neither is it intended that any of the above courses shall be a blind alley, in the sense that it leads to no higher work. Nevertheless, it is obvious that a pupil from the industrial arts course who wishes to go through high school will have to take additional time in order to meet the language requirements.

The above represents a type of development in educational administration which will probably realize the purposes of the so-called six years' course of study, without involving premature differentiation of classes of pupils on the basis of their ability or economic state in life. It will afford an opportunity to make of foreign language study something more effective than is possible at the present time. It will promote departmental teaching, and the introduction of college-trained teachers in the higher grades. D. S.

Maintenance and Support. — It is only within recent years that any real attempt to aid in the maintenance of secondary schools has been made by the states or counties, and the giving of such aid, though becoming more common each year, is still not a general feature of our state school systems. (See APPORTIONMENT OF FUNDS.) In some states no distinctions are made between common or elementary schools and high or secondary schools, either in statistics or in finance. Communities which maintain secondary schools are placed on the same footing as communities that do not, with the result that the maintenance of a high school is purely a local burden. Secondary education is, comparatively speaking, so recent an undertaking that most states have not as yet made any definite provision for the equalization of its advantages. These schools, however, have recently grown greatly in popular favor, due in part to the need of increased education to meet the changed conditions of life, to the introduction of new studies and methods of instruction, and to the changed conception of the purpose of secondary instruction. The result is that the high school is destined soon to be a regular and a necessary part of our systems of public instruction, and that high school facilities will be provided for all. This change in attitude is certain to add force to the demand for some form of general aid for secondary, as well as for elementary instruction. The maintenance of elementary schools and a state university, and the refusal to help in the maintenance of secondary schools, is not a logical position for a state to assume.

The expense of maintaining secondary schools is so much greater than that for elementary schools, due to the need of better trained and more expensive teachers, smaller classes, the smaller number enrolled, and more expensive teaching equipment, that the need of some general aid is apparent, if they are to be developed at all generally. This is accentuated by the fact that the cost for elementary schools is also increasing, and that the money now at hand and originally intended for the support of elementary schools alone is rapidly proving insufficient for the support of both classes of schools. Many communities are at present trying to support a full twelve-year school system with funds hardly sufficient to properly maintain the elementary schools.

Such provision as has been made by the different states extends from mere permission to communities to form such schools and to tax themselves to pay for them, — which is analogous to the first legislative permission to the people of a community to organize a taxing district and tax every one for the support of an elementary school, — to a general state tax levied for the support of secondary education and apportioned and used for that purpose alone. The first is the mere beginnings and the second is the culmination of the process, and between the two are many intermediate plans for the granting of some degree of aid to secondary schools.

Mere permission to cities, towns, districts, and unions of districts to form a high school and to tax themselves to pay for it, must be regarded as the first step in the process of the evolution of a system of general aid to secondary education. A petition and an election are the usual preliminary steps, and after the formation of the high school district an annual local tax, frequently of a limited amount, is permitted for the support of the school. Sometimes such schools are under the control of a separate school board, known as a high school board (*q.v.*), and sometimes the board which has control of the elementary schools merely takes charge of the high school also. A number of states have taken this first step, but have not gone further. The next step is found where the principle of local support is retained, but the taxing area is extended to a larger area, as to the county as a whole. In states which have taken this step, common in the West, we find the county high school. The common features of these permissive high school laws are the necessity of a petition asking for the submission of the question of the formation of a county high school to a vote of the people, a special election to decide the question, the appointment or election of a board of trustees for the school, an annual county tax for support, free tuition in the school to all residents of the county, and usually provisions for the dissolution of the school, after a time, if desired, by vote of the people. With the formation of a second county high school at some other place, or with the segregation of a certain district or districts to form a local high school separate from the county high school, the process of subdivision of the high school district has begun.

The next step in granting aid to high schools is taken when the state begins to make a series of grants, or subsidies, to aid secondary schools. A number of states have taken this step, though the plan has been worked out but poorly in most of the states. The granting of such aid naturally stimulates the development of high schools, and if the appropriation to pay the grants or subsidies is not of a flexible form, and one that increases with the growth of the schools, the result will be a failure to provide the aid intended. Where a definite legislative appropriation has to be made to pay the grant, as in a number of the states, the appropriation is likely to fail to increase as fast as the schools do, and the result is a forced scaling down of the grant. In Minnesota, for example, the state aid determined upon was $1000 to each properly approved school, but the schools increased so much faster than did the appropriation that the grants were scaled lower and lower for a number of years. The same thing happened in Pennsylvania. This gives an uncertainty to the value of the grant which makes the method less desirable than other plans that can be devised. The method, also, places all of the premium on the mere existence of the school, but none on the employment of a sufficient number of teachers to do the work properly, or on the addition of such subjects of instruction as will make the school of greater worth. A school with only a single "classical course" stands on the same footing, so far as state aid is concerned, with another school which employs relatively more teachers and offers two or three courses of instruction. The second school will cost much more per capita to maintain, assuming that the two are located in somewhat the same kind of communities, and will attract more students and will render a much larger educational service, but under the lump subsidy plan of aid it will receive no greater reward than the smaller and poorer school. If it is worth while to aid secondary education at all, then the state ought to so apportion its aid as to place a premium on the giving of instruction under good educational conditions. The subsidy method places no premium on growth or better instruction, and makes the position of the state as to the improvement of existing conditions a purely negative one. The subsidy method marks the beginnings of state aid, and ought to be abandoned as soon as possible for a better form of assistance. If the subsidy plan is to be used, it ought to be graded both as to years and character of instruction offered, and the power to grant, scale down, or withhold the grant ought to be centralized in some responsible educational body, possessing powers of inspection. The one marked merit of the subsidy plan, where graded subsidies are employed based on the number of years of instruction offered, is that it places a premium on the development of two-year and three-year high schools, as well as four-year schools. Any good instruction beyond the grammar school, even if for only one year and taught to only a few pupils, is a stimulating influence which reacts most favorably on all lower instruction. Two-year high schools frequently develop into four-year high schools, and communities are usually able to provide two years of instruction before they would be able to provide a fully equipped four-year high school.

California and New Jersey stand as examples of states which have reached the culmination of the process. In both states the high school has been adopted as a part of the state school system, though by a somewhat different method in each. In California the complete adoption of the high school has come through the provision of separate and special taxation for the support of high schools and by a constitutional provision that the income from the state school fund, and the proceeds of all previous taxation, can be used only for the support of elementary schools. This forever prevents the robbing of the elementary schools to maintain high schools, a process which goes on in many of our states. For the support of the high schools of the state a special state tax for high schools is levied and apportioned. To keep the income for this purpose constantly up to the needs of the schools, it has been provided that the tax to be levied shall be determined annually by multiplying the number of high school pupils in average daily attendance in the state the preceding year by $15, which requires a state tax of approximately 1½ mills. This is then apportioned to all approved high schools in the state on the following basis: one third equally to all schools, regardless of size, and two thirds to all schools on the basis of average daily attendance. The apportionment plan could be improved still further by making a partial apportionment on the basis of the number of teachers actually employed. Length of term is here a negligible factor, because all schools are required to maintain a term of at least 180 days to receive any aid. New Jersey offers an example of the complete incorporation of secondary education into the state school system. Here the apportionment of school funds is made to high schools as to elementary schools, on the teacher basis, viz. $400 for every teacher actually employed in each high school, and the remainder on a basis of so much per pupil per day in actual attendance, in all kinds of schools. The apportionment of state aid to a high school is thus made on a plan similar to a kindergarten, primary school, or grammar school. All belong to the same state school system, all share in the apportionment of funds, and all are paid out of a common fund. The value of such a plan, if sufficient revenue can be obtained, is at once evident. High schools cease to be a separate part of the school system, and become an integral part of the system of public instruction. The state then rewards a community's efforts according to the amount of instruction provided, as measured by the number of teachers employed, and according to the actual amount of work done, as measured by the attendance upon the instruction offered. If a rural union school will provide only the ninth-grade work, and thus give the boys and girls in the rural districts a taste of something beyond the common school branches, the state will reward such an effort by a grant for both the teacher employed and the extra attendance resulting. If a village will employ one additional teacher and provide two years of high school instruction, the state will similarly reward such effort. To the large city school the state offers a similar standing premium on additional effort, every new teacher and line of work added receiving additional aid. The simplicity, justice, and automatic adjustment of the plan to community needs and efforts are strong points in its favor. One thing, though, which ought always to accompany such a complete incorporation of the high schools into the public school system, is a proportional increase of available funds, with provision for an automatic increase. There is no wisdom in incorporating high schools into the state school system, if the elementary schools are to be made to pay the bills.

Such an incorporation of high schools into the system of public instruction is not possible if the census basis of apportionment is used. (See article on APPORTIONMENT OF SCHOOL FUNDS.) The essential unit in higher, as in elementary instruction, is the teacher who must be employed to teach the pupils, and not the number of pupils alone. Under a combination of teacher-actually-employed and attendance bases, as used in New Jersey, the high school is placed on the same basis as any other school, and thus becomes an integral part of the system of public instruction. The California and the New Jersey plans are the best that have been evolved for the support and incorporation of high schools. The California plan is especially meritorious in that it provides a separate and a large fund for aid to secondary education, and the New Jersey plan is especially commendable in that it establishes one organization. In view of the possibility of a reorganization of the plans for upper grammar grade and high school instruction (see article on INTERMEDIATE HIGH SCHOOLS), this must be considered an important gain. If in the future a six-year high school should prove to be a desirable addition to our school work, the present somewhat regid classification in some states would stand in the way.

Another form of support for high schools comes in the attempt to abolish tuition fees for those children who do not happen to live in high school districts. Children who live in cities, towns, or districts which maintain high schools of course have free high school tuition, but children who live in adjoining districts which are not a part of some high school district are almost invariably forced to pay a tuition charge, and this is frequently made very high for the purpose of reducing the attendance of such outside pupils. The unfairness of such tuition charges is at once evident, and a number of states have attempted to do away with them. The method employed in doing so varies in different states. In Indiana the pupil applies in person for a transfer, which, if granted, carries with it the payment of fees; in Ohio the township from which the pupil comes is directed to assume the fees; in Wisconsin a bill is presented by the school receiving the pupil to the district from which he comes, and then a tax is levied to pay the bill; in Massachusetts the town in which the pupil resides must pay the tuition charge, unless it is one of a class of poorer and smaller towns, in which case the state pays the bill; and in Connecticut the state reimburses towns for two thirds of the tuition paid, and will also pay one half of the cost of transportation. In California a very simple and very effective method has recently been worked out, whereby every child in the state has free high school privileges. The county superintendent of schools of each county is required to estimate annually the number of probable high school pupils for the coming year who live in non-high-school territory, and then to have levied by the county authorities a county high-school-tuition tax sufficient to pay the tuition charge of all non-high-school district pupils in the nearest or most convenient high school. As the state pays the high schools for all pupils in average daily attendance, this includes state aid to all. It remains purely optional with a district now whether it will form a high school of its own, join a high school district already in existence, or pay its tax for the tuition of non-high-school pupils. In any case the cost is paid by general taxation, levied on all property for high school purposes. E. P. C.

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See also *Educational Review* and *School Review.*

HIGH SCHOOL, ACCREDITED. — See ACCREDITED SCHOOLS.

HIGH SCHOOL, ACCREDITING OF. — See ACCREDITED SCHOOLS; COLLEGE EXAMINATION AND CERTIFICATION BOARDS.

HIGH SCHOOL, AGRICULTURAL. — See AGRICULTURAL EDUCATION, under the subdivision on Secondary Schools.

HIGH SCHOOL AS A SOCIAL CENTER. — See SCHOOL AS A SOCIAL CENTER; also the RURAL SCHOOL PROBLEM.

HIGH SCHOOL ATHLETICS. — See ATHLETICS, EDUCATIONAL.

HIGH SCHOOL BOARDS. — Boards of control having charge of the general management of high schools. Such boards are found in states where the organization of high schools, separate from elementary schools, has been provided for in the laws. This is commonly found in the West. In many Western states the law provides for the organization of district high schools, town high schools, and city high schools, by action of the people or of the Boards of Education or Trustees for such districts, towns, or cities; and also for the organization of union high schools by the joint action of two or more boards or districts, and county high schools by vote of the people of an entire county. In the first case the Board of Education for the elementary schools of the district, town, or city becomes the high school board as well, and, except in so far as the finances of the two schools are usually kept separate, the two classes of schools are managed as a unified system by the one board. The added high school merely becomes a part of the public school system of the district, town, or city, and has no separate management, except in some states where high school money must be levied and paid out separately from elementary school funds. In the case of union district high schools a separate board of education is elected to take charge of the high school, usually consisting of representatives from each of the districts so uniting to form the union high school. In the case of county high schools, the County Board of Education, where such a body exists, is usually made, *ex officio,* the high school board for all county high schools, and where it does not exist a special high school board is elected. In many of the Southern states, and in some of the upper Mississippi Valley states, county high schools, partly or largely agricultural in type, have been created within recent years. These are supported by general county taxation and state aid grants. These schools are under the county boards of education, or special county high school boards, elected or appointed for the special purpose. The county superintendent is commonly a member, *ex officio,* of such high school boards. E. P. C.

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The California School Law, *High School Act,* contains a good explanation of this form of separate high school management, and the North Carolina or North Dakota School Laws describe the county high school of agriculture type of high school management.

HIGH SCHOOL, COEDUCATION IN. — See COEDUCATION.

HIGH SCHOOL, COMMERCIAL. — See COMMERCIAL EDUCATION.

HIGH SCHOOL DISTRICTS. — School districts organized primarily for the establishment and maintenance of a high, or secondary school. Sometimes these coincide with existing school districts, formed for the maintenance of elementary schools, as in towns or cities; sometimes they are larger and include two or more elementary school districts, and not infrequently a dozen or more elementary school districts. Sometimes the high school district is the same in size as a township, and sometimes, especially in the West, the same in size as a county. See DISTRICTS; HIGH SCHOOL BOARDS; HIGH SCHOOLS, SUPPORT OF.
E. P. C.

HIGH SCHOOL, EVENING. — See CONTINUATION SCHOOLS; INDUSTRIAL EDUCATION.

HIGH SCHOOL FRATERNITIES. — This term applies to organizations of high school pupils modeled in imitation of the Greek letter societies in colleges. (See FRATERNITIES.) The high school secret society is usually designated by a Greek letter symbol taken from the initials of the motto of the club. Rites of initiation, grips, pass words and the other usages of secret organizations are common features.

These societies began to appear about the year 1890. At first the movement attracted but little attention, although in some instances high school principals and teachers gave sympathy and support, but in most cases wherever any attitude was assumed by the school authorities, it was in opposition to such societies. The number of organizations increased rapidly, and with this increase came a more thorough organization. The society chapters began to form national organizations. Instead of using the homes of the members as places for the gatherings, many chapters secured rooms in office buildings, wherein meetings were held. The expense of membership increased. Serious abuses appeared in the practice of the rites of initiation and in the influence of the societies upon high school discipline and scholarship. As a result, the subject of high school secret societies came to attract the earnest attention of schoolmen, of superintendents, and of various educational organizations throughout the United States. One of the most notable investigations was that conducted by the National Education Association through a special committee, reports from which were presented at the 1904 meeting at St. Louis and at Asbury Park in 1905. In 1904 a report was made by a committee on the influence of fraternities in secondary schools to the eighteenth Educational Conference of the academies and high schools in relation with the University of Chicago. Under the auspices of the Massachusetts Council of Education a study of high school fraternities and sororities was made and a report presented to that body in 1905. The consensus of opinion in each case was that the high school secret society, whether a fraternity composed of boys, or a sorority composed of girls, is an undesirable element in the life of the secondary school. The reasons adduced are as follows:

(1) The influence on the school is injurious by reason of the division of the school into cliques, the introduction of petty politics, and the loss of interest on the part of pupils in literary and other organizations with serious purpose. (2) The pupil suffers injury; the protection of secrecy gives opportunity for much evil to be practiced in the fraternity rooms. There is a decline in the spirit and standards of scholarship of the individual pupil. (3) There is no real need for such organizations in the high school because conditions are so different from those in college. (4) Such societies set up improper standards, and counteract the influence of the teacher. (5) They constitute a source of danger in the proper government of the school.

As a result of the findings of these various committees and of the expressions of opinion from men prominent in the work of education, boards of education have undertaken to lessen the influence and power of these societies or to eliminate them entirely from school life. Often such action has been met by determined opposition on the part not only of pupils, but of parents. In several instances the decrees of boards of education have been resisted and an appeal made to the courts. A notable instance is that of the Seattle High School Fraternity, before the Supreme Court of the state of Washington. The directors of school district No. 1 in Seattle had established a rule whereby the use of the name of the Seattle High School by a fraternity was forbidden, and pupils were prohibited from becoming members of any secret society under penalty of being deprived of all privileges of the school outside of the classroom. A pupil so punished brought suit through his guardian to compel the school directors to restore him to these privileges. The judge sustained the action of the school committee. In several other cases the right of the school authorities to inflict various penalties on pupils for membership in secret societies has been sustained by the courts.

In a number of states drastic legislation has been passed with a view to controlling or abolishing the secret society in the high school. In 1907 Indiana, Kansas, and Minnesota passed laws of this nature. In addition to recourse to legislation, principals, superintendents, and school committees have undertaken in different cities to deal with the fraternity question by appeal to public opinion and by regulations forbidding the use of the schoolrooms, the school name, or the recognition of the organizations in any way in connection with the school publications. In some instances the coöperation of parents has been secured and the societies eliminated. In other cases the pupils themselves have joined with the teachers and agreed to give up the organization. The influence of the secret societies in the school itself has been successfully met by the encouragement on the part of the teachers of clubs and organizations of pupils each of which is based upon some real and valuable interest, such as debating, publication of school papers, glee clubs, and French and German circles. Under proper guidance membership in such organizations soon comes to be valued and esteemed by the pupils, and the secret society to some extent loses its charms.

The high school fraternity has its defenders not only amongst the pupils, but among parents and in the general public. It is claimed that such clubs constitute a natural and fitting opportunity for the expression of the social instincts of young people of high school age, and that the members learn important lessons in coöperation in managing the affairs of the society and in conducting various enterprises in the name of the club. It is pointed out by these advocates of the system that the abuses of which so much complaint has been made are incidental, and that under proper supervision and control such evils need not exist. They argue further that in schools where all the members are admitted to such societies there will not arise feelings of rivalry and jealousy such as exist where some members are left out in the choice for these organizations. The consensus of opinion is, however, against the existence of such exclusive sets or coteries of pupils in a public institution supported by taxation, because their very presence is inconsistent with a truly democratic spirit.

W. O.

See Fraternities.

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HIGH SCHOOL INSPECTION AND APPROVAL. — See Accredited Schools.

HIGH SCHOOL INTERMEDIATE. — See Intermediate High School.

HIGH SCHOOL, MANUAL TRAINING. — See Manual Training.

HIGH SCHOOL, NORMAL TRAINING CLASS IN. — See Normal Schools.

HIGH SCHOOL, RELATION TO COLLEGE. — See College Examination and Certification Boards; Accredited Schools; College Requirements for Admission.

HIGH SCHOOL, SELF-GOVERNMENT IN. — See Self-Government in Schools.

HIGH SCHOOL, STATE AID FOR. — See High Schools, Section on Support.

HIGH SCHOOL TEACHERS, TRAINING OF. — See Teachers, Training of.

HIGH SCHOOL, TUITION CHARGES IN. — See High School, section on Support.

HIGHER EDUCATION. — A term somewhat loosely used with different connotations not only in different countries, but in each individual country. In England it is used by the Board of Education to refer to " education other than elementary." (See Education Act 1902, Pt. III, § 2); but in Graham Balfour's *Educational System of Great Britain and Ireland* (Oxford, 1903) higher education refers to " that general training given in Universities and University Colleges," while the most recent work on secondary education bears the title *Higher Education of Boys in England* (Norwood, C., and Hope, A. H., London, 1909). The same confusion exists in Germany. Lexis, *Das deutsche Unterrichtswesen*, uses the term *Das höhere Schulwesen* to refer to the secondary school system, while Fick, *Auf Deutschlands Hohen Schulen*, deals entirely with the German universities, and the term *Hochschule* always signifies an institution of university grade. In southern Germany this attitude is well marked by the designation of secondary schools as Middle Schools (*Mittelschulen*). The German use is also prevalent in the United States, where higher education refers to such education as is given above the high schools. Thus the title of Chancellor Brown's work, *The Making of our Middle Schools* (New York, 1903), is intended to mark the place of secondary education as intermediate between elementary and higher, and this use is more clearly emphasized in various essays on " Higher Education," which deal with the education in the college and university. In France the term *Education Supérieur* definitely means education beyond the secondary schools.

See Mittelschule.

HIGHER NORMAL SCHOOL OF FRANCE. — See Normal Schools.

HIGHLAND COLLEGE, HIGHLAND, KAN. — A coeducational institution which grew out of the Indian Mission School. Opened as a university in 1857, it is under the auspices of the Presbyterian Synod of Kansas. Academic, collegiate, commercial, and music departments are maintained. The entrance requirements are equivalent to about fifteen units. The degrees of A.B. and B.S. are conferred on the completion of the necessary courses.

HIGHLAND PARK COLLEGE, DES MOINES, IA. — A coeducational institution founded in 1889, now under the control of the Presbyterian Church. It maintains a normal college, academy, colleges of liberal arts, law, engineering, pharmacy, music, oratory, commerce, a correspondence school, and a summer school. The college gives degrees of A.B. and B.S., on three-year courses. Lower credits are required for admission to the three-year engineering courses. There is a faculty of sixty members.

HILDEBRAND, HEINRICH RUDOLPH (1824–1894). — German philologian, who exercised considerable influence on the teaching of German in elementary schools. Born in Leipzig, he attended the Thomasschule, and thence proceeded to the university. He returned to his old school in 1848, and proved a very capable teacher. His interest, however, was mainly in linguistics, and as early as 1859 he began to assist Jacob Grimm in the edition of his dictionary, and on his death became one of the coeditors of the work. In 1868 he resigned his position at the school, and in 1869 became extraordinary and in 1874 ordinary professor in the University of Leipzig. His chief work was *Vom deutschen Sprachunterricht in der Schule und von deutscher Erziehung und Bildung überhaupt* (*Teaching of German in the School and German Education and Culture generally*, 1865), in which he recognizes the cultural and national value of training in the vernacular. He emphasizes the importance of oral expression in the schools and the teaching of the significance and history of words, believing, as he did, that language in its development presents a composite picture of national history and growth. For similar reasons he would not neglect dialect forms, the embodiment of the thought and life of the people. His other works are *Beiträge zum deutschen Unterricht* (*Contributions to the Teaching of German*, 1886); *Gesammelte Aufsätze und Vorträge zur deutschen Philologie und zum deutschen Unterricht* (*Collected Essays and Lectures on German Philology and Instruction*, 1890).

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HILFSSCHULEN. — See Exceptional Children; Special Classes.

HILL, FRANK ALPINE (1841–1903). — Superintendent of public instruction in Massachusetts; was educated at the Biddeford, Me., High School and at Bowdoin College, graduating in 1862. He was principal of secondary schools in Maine and Massachusetts from 1862 to 1893, when he was chosen secretary of the State Board of Education of Massachusetts, which position he filled for ten years. He was active in the organization of district school superintendents in the state. His educational writings include *Seven Lamps of the Teacher* (1902), a textbook on United States history (with John Fiske), and numerous essays on educational subjects. W. S. M.

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HILL, JOHN HENRY (1791–1882). — Founder of the Hill School at Athens, Greece; was graduated from Columbia University in 1807. He went to Greece as a missionary in 1830, and two years later established the Hill School at Athens. This institution, which includes elementary, secondary, and normal departments, had large influence on the subsequently organized municipal schools at Athens and the national schools of Greece. He translated a number of American and English books into the modern Greek. W. S. M.

HILL, MATTHEW DAVENPORT. — See Hill, Thomas Wright.

HILL, SIR ROWLAND. — See Hill, Thomas Wright.

HILL, THOMAS (1818–1891). — Twentieth president of Harvard University; was graduated from Harvard. He was president of Antioch College from 1859 to 1862, succeeding Horace Mann (*q.v.*), and of Harvard University from 1862 to 1868. His educational works include an *Arithmetic* (1845), *First Lessons in Geometry* (1855), *Liberal Education* (1855), and *True Order of Studies* (1859). He invented the occultator and other contrivances for the teaching of mathematics. W. S. M.

See Harvard University.

HILL, THOMAS WRIGHT (1763–1851). — English educational reformer; born at Kidderminster, Apr. 24, 1763, the son of a baker and dealer in horse corn. Hill received his early education in a school at Market Harborough kept by a Nonconformist minister. In childhood he showed a strong taste for literature and physical science. At the age of fourteen he was apprenticed to a brass founder in Birmingham, where he became a member of Joseph Priestley's congregation, and threw himself with energy into the work of Sunday school teaching in connection with Priestley's chapel. He invented a system of shorthand, and devised a plan for the representation of minorities by a proportionate vote. Hill was the father of a distinguished family: viz. Matthew Davenport Hill (1792–1872), reformer of the criminal law, friend of Jeremy Bentham (*q.v.*), colleague of Mary Carpenter (*q.v.*) in the establishment of reformatories, and active advocate of the boarding out of pauper children; Edwin Hill (1793–1876), writer on the currency and an ingenious inventor who improved the machinery for the manufacture of stamps; Rowland Hill (1795–1879), who planned the scheme of penny postage and by persistent advocacy forced it upon a reluctant and ungrateful government; Arthur Hill (1795–1879), schoolmaster, whose son, George Birkbeck Hill, was editor of Boswell's *Life of Johnson;* and Frederic Hill, Inspector of Prisons in Scotland and afterwards Assistant Secretary in the Post Office.

Hill's school in Birmingham was the result of the joint labors of himself, his wife, and four of his sons, Matthew Davenport, Edwin, Rowland, and Arthur. It is difficult to assign the original ideas which underlay its organization and discipline to the several members of this family group. Perhaps the greatest credit should be ascribed to Rowland, who, greatly influenced by Maria Edgeworth's stories, began to teach in his father's school at the age of twelve, distinguished himself as a teacher of mathematics, and, at the age of seventeen, undertook the entire management of his father's money affairs and at last cleared off his debts. Rowland recorded in his *Journal* that it was the height of his ambition "to establish a school for the upper middle classes wherein the science and practice of education might be improved to such a degree as to show that it is now in its infancy." A new house was built for the school at Hazelwood in the outskirts of Birmingham, and its educational method became famous as the Hazelwood system. Special attention was paid in the curriculum (*a*) to the teaching of languages in which the "natural method" was employed, *i.e.* both dead and modern languages were taught in great measure orally and by conversational methods, the abstract technicalities of grammar being relegated to a subordinate place; (*b*) to elocution, with the purpose of refining literary taste and teaching right enunciation and inflection; (*c*) to the art of writing in such a way as to combine beauty and swiftness; (*d*) to the scientific teaching of arithmetic, including mental calculation and applied geometry and open-air surveying; and above all (*e*) to the formation of character and to inculcation of right ideas of moral duty, including a sense of civic obligation, the cultivation of social sympathy, and the love of justice. A full description of the aims and methods of the school was published (anonymously) by Matthew Davenport Hill in a work entitled *Plans for the Government and Liberal Instruction of Boys in Large Numbers, drawn from Experience*. This book was epoch-making. It forms one link of a chain of influence, which, beginning with Rousseau's *Emile*, took on English characteristics in the *Practical Education* (1798) of R. L. and Maria Edgeworth (*qq.v.*), and subsequently culminated in Stanley's *Life of Thomas Arnold* (1844). The authors of the book show that they are well acquainted with some of the writings of Pestalozzi and also of the older English educational reformers and of the French encyclopedists of the eighteenth century. Shortly after its publication (in 1822), Hill's book was reviewed by De Quincey. It fascinated Jeremy Bentham, and secured for the school the enthusiastic patronage of the Benthamite group. Numbers of pupils were sent to the school from the newly founded republics of South America and from Greece. A school was established in Stockholm in imitation of it. There is little doubt that the educational discussions provoked by the publication of the book had considerable influence upon the mind of Dr. Arnold, and bore fruit in his work at Rugby, 1828–1843. In 1827 the main body of the school was transferred from Hazelwood to Bruce Castle, Tottenham, near London.

As for the mechanism of their plan of school government, they recognized their indebtedness to the monitorial tradition of medieval education and of the English Public Schools, but disclaimed any debt to Bell and Lancaster, whose services they recognized, but whose purpose they regarded as dissimilar. They applied somewhat inconsiderately to school conditions the machinery of elective local government, thus anticipating later experiments in the formation of the school city. Their ideal was a judiciously supervised, self-governing boy democracy. The details of their scheme were overintricate and a little doctrinaire. Joshua Toulmin Smith (1816–1869), himself a native of Birmingham, and, like the Hills, a member of the Unitarian Church, shared the same antiquarian enthusiasm for pure local democracy. But the vital significance of the educational doctrine of the Hills lay in its emphasis upon the moral and spiritual power which may be developed through the wise organization of corporate life in a skillfully ordered community. This is the conception which appealed to Thomas Arnold (*q.v.*), and to which he gave effective development at Rugby, with far-reaching results upon higher education throughout the world. The Hills were thus among the first to give utterance in the sphere of education to the new collectivist ideal which arose in reaction to the individualist presuppositions of eighteenth-century rationalism and of the French Revolution. One defect of their scheme, as of Dr. Arnold's, was that their school bore no organic relation to the public life of the adult community which it served. The Hills in their private school, like Dr. Arnold in the endowed school at Rugby, were, though intensely civic in purpose, unconsciously separatist in their influence upon subsequent educational organization. But in the circumstances of the time, this was inevitable — the close connection of King Edward School, Birmingham, with the Church of England making it natural that Nonconformist parents of the middle ranks should support a private school more in accordance with their convictions, just as the presuppositions of the then central government made it natural that Arnold of Rugby should resist any extension of state control over the religious and intellectual life of the great Public Schools. A chief part of the work of recent educational reformers in England has lain in the attempt to bring the conception of corporate school life (which is largely due to the work of the Hills and of Dr. Arnold) into living relation to the educational systems under government and local authorities.

A second defect in the system of the Hills, as also in that of Arnold of Rugby, was that it tended to induce precocity of moral sensitiveness. A former pupil, W. L. Sargant, wrote of it: "By juries and committees, by marks and by appeals to a sense of honour, discipline was maintained. But this was done at too great a sacrifice. The thoughtlessness, the spring, the elation of childhood were taken from us; we were premature men."

M. E. S.

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HILL, WALTER HENRY (1822–1907). — Jesuit educator; was educated at St. Mary's College at Marion, Ky., and at St. Louis University. He was instructor in St. Joseph College, Ky., and St. Louis University, and was president of Xavier College from 1865 to 1869. He was author of *Elements of Philosophy* (1873), *Ethics* (1878), and *Historical Sketch of St. Louis University* (1879). W. S. M.

HILLARD, GEORGE STILLMAN (1808–1879). — Educational writer and textbook author; was graduated from Harvard College in 1828. Between 1856 and 1863 he published twelve school readers. He was also the author of a work on public instruction in Prussia (1836) and of numerous articles on the common schools of New England.

W. S. M.

HILLHOUSE, JAMES (1754–1832). — Statesman; graduated from Yale College in 1773. He engaged in the practice of law; served as an officer during the Revolutionary War; represented Connecticut in Congress from 1791 to 1810, acting as president *pro tempore* of the Senate after the election of Thomas Jefferson to the presidency; he was commissioner of the common school fund of Connecticut (practically state superintendent of education) from 1811 to 1825, and for fifty years treasurer of Yale College (1782–1832).

W. S. M.

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HILLSDALE COLLEGE, HILLSDALE, MICH. — A coeducational institution, opened Dec. 4, 1844, at Spring Arbor, Mich., as the Michigan Central College. In 1853 the site was changed to Hillsdale, but the college was not opened there until Nov. 7, 1855. There are seven departments, as follows: liberal arts, preparatory, theology, music, fine arts, oratory, household economics, pedagogics, business and shorthand. There were twenty-six members on the instructing staff in 1910–1911. The total enrollment in the same year was 371 students.

HINDU EDUCATION. — See INDIA, EDUCATION IN.

HINDU NUMERALS. — See NOTATION.

HINSDALE, BURKE AARON (1837–1900). — American professor of education and educational writer; was born at Wadsworth, Ohio, on Mar. 31, 1837, and was educated at the Eclectic Institute (afterwards Hiram College). He was for several years engaged in the work of the ministry. He was president of Hiram College from 1870 to 1882; superintendent of the schools of Cleveland from 1882 to 1886, and professor of the science and art of teaching in the University of Michigan from 1888 to 1900, succeeding William H. Payne (*q.v.*). His contributions to educational journals were numerous, and he wrote a large number of books on education. The latter include *Schools and Studies, President Garfield and Education, The Art of Study, Studies in Education, Jesus as an Educator, How to Teach and Study History, Teaching the Language Arts, Horace Mann and the Common School Revival in the United States,* and *History of the University of Michigan.* He published several works on American history and edited the writings of James A. Garfield. He was also active in the council of the National Education Association and the Michigan State Teachers' Association. W. S. M.

For portrait, see p. 219.

See EDUCATION, ACADEMIC STUDY OF; HIRAM COLLEGE; MICHIGAN, UNIVERSITY OF.

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HIPPARCHUS. — The greatest of the Greek astronomers; born at Nicæa in Bithynia, *c.* 160 B.C. He seems to have studied at Alexandria; but the greater part of his work was done at Rhodes. He was a very careful observer, and he determined the length of the year to within six minutes, the obliquity of the ecliptic to within five minutes, the annual precession of the equinoxes to within eight minutes and eight seconds, and the eccentricity of the solar orbit to within $\frac{1}{120}$. He made numerous other important discoveries and laid the foundations for the work of Ptolemy. (See PTOLEMY and ALMAGEST.) He may be called the first great teacher of astronomy and the first to place it upon a scientific basis. While trigonometry (*q.v.*) had made a beginning before his time, he was the first to use it in any large scientific way, and he has therefore been looked upon as entitled to be called its inventor. Geography is also greatly indebted to Hipparchus, since he was the first to locate places upon the earth's surface by means of their latitude and longitude. D. E. S.

HIPPIAS. — See Geometry.

HIPPOCRATES (*c.* 460–370 B.C.). — Greek physician and philosopher, the "Father of Medicine," born at Cos of a family of priest-physicians, the Asclepiadæ. His training he probably received mainly in the famous temple of health (Asclepion) at Cos. He studied under the sophists, Democritus and Gorgias, and under Herodicus, who applied physical exercises to the healing art. He traveled extensively, and practiced in many places. Many stories cluster around his name; the majority, however, are legendary. In a rationalistic age Hippocrates was the first to establish a medical science independent of superstitions and priestcraft and of philosophical speculation. There was no one disease, he held, without a natural cause. Diseases are due to seasons, climates, water, location, air, food, or exercise. The chief remedies for disease are regimen and diet, but there is also an innate restoring essence (φύσις, *vis medicatrix naturæ*). Numerous works are attributed to Hippocrates, but of these only about fifteen are regarded as genuine. His writings are marked by careful observation and broad experience. Many of his medical principles have stood the test of centuries. But his anatomical contributions are naturally of less value, although it would appear from some of the descriptions that he knew something of anatomical dissection. His chief work is the *Aphorisms*, a collection of about 400 sentences on principles of medicine, physiology, and natural philosophy. This has been translated into all the languages of the civilized world. With those of Galen, the works of Hippocrates formed the chief subjects of study in the medieval medical faculties. They were translated in the sixth century into Latin, and although they were lost, a Græco-Latin medical tradition seems to have been established. After the middle of the eleventh century the knowledge of Hippocrates was direct and the *Aphorisms* were translated from Arabic into Latin by Constantius Africanus about 1080. He was especially studied at Salerno and Montpellier, where Rabelais lectured on his works in the original Greek in 1537. How great has been the reverence for the "Father of Medicine" is shown by the fact that the Hippocratic oath is still administered to medical graduates in many American universities (*e.g.* Columbia University). The following is a translation of the oath, which is instinct with the highest ideals for the profession: —

"I swear by Apollo the Physician and Æsculapius, and I call Hygeia and Panacea and all the gods and goddesses to witness, that to the best of my power and judgment I will keep this oath and this contract: to wit — to hold him, who taught me this Art, equally dear to me as my parents; to share my substance with him; to supply him if he is in need of the necessaries of life; to regard his offspring in the same light as my own brothers, and to teach them this Art, if they shall desire to learn it, without fee or contract; to impart the precepts, the oral teaching, and all the rest of the instruction to my own sons, and to the sons of my teacher, and to pupils who have been bound to me by contract, and who have been sworn according to the law of medicine.

"I will adopt that system of regimen which, according to my ability and judgment, I consider for the benefit of my patients, and will protect them from everything noxious and injurious. I will give no deadly medicine to any one, even if asked, nor will I give any such counsel, and similarly I will not give to a woman the means of procuring an abortion. With purity and with holiness I will pass my life and practice my art. . . . Into whatever houses I enter I will go into them for the benefit of the sick, keeping myself aloof from every voluntary act of injustice and corruption and lust. Whatever in the course of my professional practice, or outside of it, I see or hear which ought not to be spread abroad I will not divulge, as reckoning that all such should be kept secret. If I continue to observe this oath and keep it inviolate, may it be mine to enjoy life and the practice of the Art respected among all men for ever. But should I violate this oath and forswear myself, may the reverse be my lot."

Of the works which have been attributed to Hippocrates, the following are regarded as genuine: *On Airs, Waters, and Places; On Ancient Medicine; On the Prognostics; On the Treatment in Acute Diseases; On Epidemics* (Books I and III); *On Wounds of the Head; On the Articulations; On Fractures; On the Instruments of Reduction; The Aphorisms* (Seven Books); *The Oath; The Physician's Establishment or the Surgery;* and *The Law.*

See Medical Education, section on History, and the References there given.

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HIPPOCRATIC OATH. — See Hippocrates.

HIPPOLYTUS (d. 236). — A disciple of Irenæus, and the most learned member of the Roman Church in the Ante-Nicene Era. He was the first anti-pope, in opposition to Callistus, but was afterwards reconciled with the reigning pope and revered as a martyr. He was a man of immense literary activity, and he and his works have been the subject of long-continued controversy. They were written in Greek, and consisted of a multitude of treatises, polemic, dogmatic, apologetic, and exegetic. Most of them have been lost. In 1842 the greater part of the *Philosophumena,* only the first book of which had been extant up to that time, was discovered in an ancient monastery upon Mt. Athos. At first attributed to Origen, and later to Caius and Epiphanius, it was ultimately assigned by the unanimous agreement of scholars to Hippolytus. It is a refutation of all heresies by tracing their origin to pagan philosophy and Oriental theosophy. Its author is as uncompromising a foe to the ancient systems of philosophy as Tertullian himself (*q.v.*), and exhibits great acuteness in tracing the relationships between them and the heresies which disturbed the early Christian Church. His work is also valuable as a source-book of history. W. R.

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HIRAM COLLEGE, HIRAM, OHIO. — Founded in 1850 by the Disciples of Christ as the Western Reserve Eclectic Institute for the education of both sexes. From 1856 to 1861 and from then to 1866 with intervals President Garfield (*q.v.*) was principal and lecturer at the Institute, which in 1867 became Hiram College. In 1907–1908 the Board of Trustees became a self-perpetuating body. The institution maintains a college and departments of music and missionary service. The entrance requirements are fifteen units. Four courses are offered in the college, literary, ministerial, philosophical, and scientific, leading to the degrees of A.B., B.S., and Ph.B. Of 345 students enrolled in different departments 224 took work in the college. The faculty consists of twenty-two members.

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HISTORY. — As a College and University Study. Content and Method. — History is concerned with the past life of man considered as a member of society. It is thus distinguished from biography, which deals only with individuals, and from anthropology, which treats of man as a unit in the animal kingdom; but these distinctions are not absolute, for the history of the individual cannot be cut off from the society in which he lives, and no sharp line can be drawn between the natural history of man and his social history. In a looser sense history is often used to denote any succession of facts, as when we speak of the life history of a plant or animal or the history of the solar system — an extension of the term which arises from the general adoption of the historical habit of thought, which looks upon all things in the universe, not as fixed and stable, but as undergoing a process of change. History comprises the whole period of the development of human society from the earliest ages for which evidence has been preserved, and includes the various manifestations of the human spirit in art, literature, and religion, as well as the vicissitudes of states and their leaders and the course of economic and social evolution. Certain of these fields are commonly marked off for separate treatment, so that we have the history of language, of literature, of art, of religion, of philosophy, as well as the social and political sciences which derive their material largely from historical records; but such a division is one of convenience only. None of these more special topics can be understood apart from the general course of historical development, and only the historian can bring them into their proper relations as parts of the evolution of civilization. Before this broader conception of history the attempt to limit it to "past politics" is rapidly losing ground, but the life of the state, as the most important social group of civilized man, must remain prominently in the foreground of history, by reason of its intrinsic significance and because on the whole it furnishes the most natural category for the classification of historical facts. History thus stands in especially close relations with political science and economics, not only because it furnishes them with the greater part of their materials, but also because it constantly needs their assistance in interpreting the social and political life of the past; and for similar reasons it welcomes the advance of any new sciences, such as comparative and social psychology, which promise to throw further light upon the social life of man.

Unlike the natural sciences, history cannot avail itself of experiment or of repeated observation. Except for the infinitely small body of information which has been acquired by his immediate personal experience, the historian depends entirely upon indirect sources of knowledge, arriving at the facts of the past only by working back from the existing traces which they have left behind them. These traces, the fountainhead of historical knowledge, are called sources. Originally limited to the oral traditions handed down in song and story, and then including written material in the bare lists of early inscriptions and annals, the conception of what constitutes an historical source has widened with the growth of knowledge and with the enlargement of our ideas of the scope of history until it now includes, not only chronicles and public documents, but newspapers and private correspondence, buildings and pictures, ideas, customs, and superstitions, clothing and tools and implements and every sort of object from which information respecting the human past may be derived. For purposes of convenience, sources are often classified into narrative, such as biographies, chronicles, and memoirs; documentary, including laws, charters, and official acts of every sort; literary, so far as literature throws light on the ideas and conditions of an age; and archæological, including the great body of monuments, works of art, and material remains. The use of these materials for historical purposes often demands technical knowledge of a very special sort, and a group of subjects has grown up which are often called the " auxiliary sciences " of history. Chief among these are language, as a means to the understanding of historical records; palæography, or the science of ancient writings; diplomatics, treating of official documents; epigraphy, or the science of inscriptions; numismatics, archæology, chronology, and historical geography.

Out of such materials and with such aids, it is the business of the historian to reconstruct the past for his readers. After he has collected his sources by patient research in libraries, archives, museums, and similar repositories, he cannot use them until he has subjected them to a searching critical examination with reference to their origin, genuineness, credibility, and value. In the case of narrative and documentary sources this may involve elaborate textual criticism in order to restore the original form of a document; the determination by external and internal evidence of its authorship and the time and circumstances of its composition (the so-called " higher criticism "); and the weighing of the value of the various assertions which the document contains, with reference to the knowledge, good faith, and impartiality of the author. The chances of error in the transmission of evidence are great, and they are enormously increased by the fact that in the case of all written or spoken sources we can only arrive at the original fact through the intermediary of the human mind which transmitted its subjective impression to us, so that history is often reproached with the uncertainty which may exist regarding events of the highest importance. While this human element makes it impossible for historical knowledge ever to attain the degree of precision and certainty which belongs to the sciences of observation, the historian is able, by means of converging lines of evidence, to establish such moral certainty as may be reached in the affairs of men; and, although this assurance is often lacking respecting particular events of a remote period, it becomes sufficient for any purpose in the case of ideas, institutions, and social conditions of wide prevalence or continued duration. Regarded from this point of view, the thoroughness of its critical search for truth and the nature of its results entitle history to rank as a science. On the other hand, the processes of historical synthesis by which the historian combines individual facts into sequences and generalizations, and with the aid of the constructive imagination groups them into an ordered work of history, give a much greater opportunity for variation and individual choice, and on this side of historical method there is as yet no such general agreement as has been reached respecting the analytic operations of historical criticism. Moreover, the form in which the result of the historian's labors are presented to the reader is a question of art, more important here than in the case of the natural sciences because of the element of sympathy and imagination which arises out of the human appeal of the subject matter of history; and the artistic presentation of history is thus a branch of literature. Inasmuch as the critical faculty, the constructive imagination, and high literary art are seldom combined in the same person, it rarely happens that a work is produced which is eminent both as a work of historical science and as a work of literature. This tends to a division of labor by which the preliminary operations of collection, criticism, and arrangement are performed by the editors of texts, the authors of *regesta*, and the writers of monographs, leaving to the synthetic historian the more ambitious tasks of historical construction. Such a division can, however, never become complete, for the historian must know how to test for himself the materials with which he is to build, and both the writer and the teacher of history must understand, though they need not regularly use, the whole historical process.

The teaching of history, at least in the higher grades of instruction, is concerned with a body of knowledge, a point of view, and a method of inquiry. The body of historical knowledge is enormous and is constantly enlarged by the progress of historical investigation as well as by the lapse of time; and the problem of the teacher is, in the first instance, to select those facts which will make clear the general course of historical development and contribute to an understanding of the periods and countries of special significance with reference to the world as a whole and to the particular country and age in which the student lives. These facts must on the one hand be seen as actual realities, against their contemporary background, while on the other hand they must be grasped, not as disconnected events or dates, but as bound together in certain relations and forming part of a continuous process of development. The student must learn that while the past is vitally connected with the present and can only be reconstructed by working back from the phenomena of actual experience, it was never the same as the present; and he must be taught to lay aside for the moment the ideas and standards of his own age in order to enter into those of the age he is studying. Impartiality, sympathy, and imagination thus become necessary qualifications for the study and teaching of history, and the attitude toward the past which is thus attained is often called " historical-mindedness." One element in this is the critical spirit, and the general student of history finds it necessary to know something of the way the historian collects and tests his materials, while the special student requires initiation into the nature of historical evidence and the processes of historical criticism and construction. Such training is necessary, not only for the professed historian, but also for those who as investigators of topics in economics, political science, education, and the history of literature, art, or philosophy, are, often without realizing it, obliged to make use of the historical method of inquiry. In the earlier stages of historical instruction, attention is given particularly to the teaching of a few simple facts and the development of the historical imagination; in the higher stages the number of facts increases and more emphasis is put upon their relations and political and social significance, and upon the acquisition of a critical and impartial habit of mind; while in the most advanced grades of instruction the student learns to find, test, and combine his facts for himself until he is able to undertake independent research.

Probably no other subject of study is so dependent upon great libraries as history. The sciences of observation depend primarily upon field work or the laboratory; the specialist in literature or philosophy can go far with a small collection of the great works in his department, but the student of history not only needs the newest works upon his subject and the standard authorities whose views he must compare and examine, but he is constantly driven back to the sources of information, which in history are almost endless. For him no book is or can ever be wholly "dead," since when it ceases to have value as a statement of facts, it always retains a place in the history of learning or of ideas, and thus serves as a source of historical knowledge. The efficiency of a university department of history is closely conditioned by the libraries to which it has access, and these must be rich in the great collections of printed chronicles and documents and in the files of periodicals and publications of learned societies, as well as in current historical treatises. Moreover, as no single library can hope to be complete, even for printed works, advanced investigation involves the necessity of visiting other libraries and archives for rare and unpublished material. For many fields of history, as well as for the whole period before written records begin, museums of art and archæology perform a function analogous to the library as repositories of historical materials, and access to them may in many cases be equally indispensable.

History in European Universities. — Although history is as old as the Greeks, it has acquired academic status only in comparatively recent times. The curriculum of the medieval universities made no provision for history, as it made none for literature, nor did the revival of learning prove immediately favorable to historical study. The only period of history for which the humanists cared was the Græco-Roman, and the study of history remained a subordinate part of the study of the Greek and Latin classics, just as oriental history was limited to a study of the Old Testament. The Protestant Revolt and the Catholic reaction gave an impetus to the study of the Middle Ages, but only on the ecclesiastical side, and so far as these movements furthered the teaching of history in universities and seminaries, their influence was confined to the history of the Christian church. The separation of history from philology on the one hand and from theology on the other was slowly accomplished and is not yet at all points complete. As an independent subject history gained its footing gradually in the course of the eighteenth century and became fully established only in the nineteenth. The rapid expansion of historical instruction in the course of the past hundred years has come about partly as the result of the great activity of historical research and the enormous extension of historical knowledge in this period; partly through the growth of nationality and democracy, and the consequent efforts to cultivate patriotism and develop the civic virtues; and partly from a realization of the need of giving the youth of each generation an orientation with reference to the development of the world's civilization and their own place in it.

In the universities of Germany history acquired an independent status in the eighteenth century, notably at the University of Göttingen; but German historical scholarship showed no peculiar strength in this period, and its preëminence was established by the school of writers and teachers which had its center in Berlin between 1810 and 1830. The pioneer in this movement was Niebuhr, in the lectures on Roman history which he gave as professor at the University of Berlin and which formed the basis of his writings on this subject, and his influence was soon apparent in the spread of his critical methods to other fields of history and in the application of the historical habit of thought to the study of law, language, and religion. With Niebuhr, as with German professors since his time, the writing and teaching of history went hand in hand, and the connection became still closer through the methods of teaching introduced in 1825 by Leopold von Ranke. "Ranke," says Lord Acton, "has not only written a larger number of mostly excellent books than any other man that ever lived, but he has taken pains from the first to explain how the thing is done." His first book, written in 1824, was accompanied by a critical discussion of the materials upon which it was based, and in the following year he reënforced his lectures at the University of Berlin by the inauguration of an historical seminary. The idea of such a meeting of professors and students for training and practice in the critical use of historical sources Ranke borrowed from the classical seminaries of which he had been a member at Göttingen; but it soon became an established feature of the university system, and in one form or another (seminary, practical exercises, *cours pratique*) it is now generally recognized as an essential element in higher historical instruction. The purpose of the historical seminary is to teach not the facts of history, but the process of historical investigation, and it is designed as a part of the training of the teacher as well as of the investigator. "An essential characteristic of the work," as it has recently been analyzed by Professor George B. Adams, is the practice of the methods of historical criticism and synthesis "together by a number of students of about the same stage of advancement, and the resulting mutual criticism and stimulus of mind by mind." The group of students must necessarily be small, and the relations with the instructor must be free and informal. The subject of study may consist of a chronicle, a series of documents, or a limited historical period or movement, and the work may be conducted either by joint discussion of a topic prepared by all the members of the seminary or through the presentation and criticism of reports or essays assigned to individual members; but such work cannot profitably be carried on unless it is so arranged that all members may take an intelligent part. The method is essentially coöperative, and frequently results in a group of published studies upon related topics. The narrative lecture and the seminary constitute the regular forms of historical teaching in the universities of Germany, Austria, and German Switzerland, and practically all these institutions maintain such instruction in ancient, in medieval, and in modern history, while at a university such as Berlin a great variety of seminary and lecture courses is offered. Significant types of allied institutions are the *Institut für österreichische Geschichtsforschung* at Vienna, which gives a thorough grounding in the auxiliary sciences and in other subjects necessary for the study of Austrian history, and the *Institut für Universalgeschichte* at Leipzig, where Professor Lamprecht has led a revolt against the more strictly political form of history cultivated by the followers of Ranke.

In France a chair of history was established at the Collège de France in 1769, but although the incumbents comprised men of the distinction of Guizot (*q.v.*) and Michelet, they tended to address their lectures to the general public rather than to students and had no special functions as teachers. The professorships at the Sorbonne were of the same sort, so that until the close of the Second Empire the actual teaching of history at Paris was confined to the *École Normale Supérieure*, which prepared teachers for the *lycées* and colleges, and the *École des Chartes*, established in 1821 for the training of archivists and librarians, but developing an excellent set of special courses which gave a sound historical training, especially in the medieval field. The foundation of the *École des Hautes Études* in 1868 opened opportunities for the special study of history similar to those afforded by the German seminary, and under the Third Republic the strengthening of the faculties of letters and the development of a university organization have given a large place to historical instruction. The universities now perform the functions once monopolized by the *École Normale*, which is now combined with the University of Paris, and in addition to the public lecture courses maintain *cours fermés* for the special training of teachers and scholars in the principal fields of history. The change in the character of university instruction is seen in the modification of the requirements of the *agrégation d'histoire*, the competitive selection of professors of history in the *lycées*, which in addition to the comprehensive examination on the general field of history now demands a thesis based upon original sources, and certain examinations on more special topics. The provincial universities seek, so far as their resources permit, to do the same kind of work as the University of Paris, but they are less liberally supported than the corresponding German institutions, and their students of history are at a special disadvantage because of the absence of the special schools and great libraries of the capital. Besides the more strictly academic training of the *École des Chartes* and the *École des Hautes Études*, the *École Libre des Sciences Politiques*, a private institution established in 1871 primarily for the purpose of fitting young men for the civil service, offers instruction in modern political and diplomatic history.

The Camden Professorship of Ancient History was founded at Oxford in 1622, and the Regius professorships of Modern History at Oxford and Cambridge in 1724, but it was not until the second half of the nineteenth century that historical studies began to occupy a position of importance in the English universities. Long subordinated to classics and later to law and the moral sciences, history was given an independent status through the establishment of the Honor School of Modern History at Oxford in 1872 and the Historical Tripos at Cambridge in 1875. The historical instruction thus organized has been almost entirely directed to the preparation of undergraduates for the final examinations for their degrees, and to this end emphasis is laid upon wide and thorough reading in standard authorities under the guidance of a tutor, who is responsible for but a small number of students. Brief courses of lectures are also given by the tutors and lecturers of the various colleges on the principal periods and fields of history covered by the examinations. Recently some progress has been made in the direction of advanced teaching, especially on the part of the university professors, who take no part in preparing undergraduates for examinations and thus have considerable leisure for graduate instruction and the guidance of research. So far few English students have availed themselves of the privileges of this sort of study, but the research degree of B. Litt., recently established at Oxford, has proved attractive to a certain number of graduates of American and colonial colleges. Among the newer English universities the University of Manchester is an important center of historical study, and the University of Liverpool has recently organized a special school of local history and records.

History in American Colleges. — Like their English contemporaries, the early American colleges made no regular provision for the study of history. The curriculum was predominantly classical, and historical instruction was limited to the history and antiquities of Greece and Rome. In course of time a few recitations upon a manual of universal history were introduced, but the nature of the required curriculum gave no opportunity for the growth of organized historical instruction. A professor of ecclesiastical history was appointed at Yale College in 1778, but the first professorship of history in the more general sense of the term was created at Harvard in 1839, and filled by Jared Sparks, who three years later brought the study of American history for the first time into an American college. Another significant date is 1857, when Henry W. Torrey took up at Harvard the work which Sparks had relinquished when he resigned the presidency in 1853, and when Francis Lieber became professor at Columbia and Andrew D. White at the University of Michigan. These three men had been trained in Germany, and the development of historical studies in the United States during the next twenty-five years is directly traceable to the influence of the German historical school. This movement, however, began slowly, and outside of the three institutions just named the systematic teaching of history belongs to the period since the Civil War. Some qualification of this statement is necessary as regards the colleges of the South, where in the generation preceding the war historical and political studies received more attention than in the North; for example, Lieber had been professor in the University of South Carolina, and instruction in history and political science, though not provided for by special chairs, had an important place in Jefferson's plans for the University of Virginia. Even in the more recent period history has made way more slowly in the smaller colleges of the East than in the state universities of the West, where the traditional subjects of the curriculum have had a weaker hold; but at the present time every reputable college has at least one professor of history and a regular sequence of historical courses which offer some sort of view of the history of the world in general and of the United States in particular.

The organization of the historical curriculum in American colleges is conditioned by the fact that their freshmen have reached the age of students in European universities without having acquired any such accurate and substantial knowledge of historical facts as is possessed by pupils of the corresponding stage of the gymnasium or the *lycée*. Accordingly, while it is possible in the later years of the college course to do work which is in many respects of university quality, this work suffers from the lack of a sufficient basis of knowledge and discipline, while the earlier years of the course must be devoted in large part to carrying on studies of secondary grade with students who are too old for the methods of secondary instruction. For this reason it is particularly important that the teaching of history should begin with the freshman year, in order to remedy as soon as possible the defects of the students' earlier training. The problem of the introductory course in college is, however, peculiarly difficult, since this course is likely to be taken by a large number of students, of wide diversity of preparation and interests, and since it has not only to serve as a basis for more advanced work, but also to meet the needs of those whose formal study of history will stop at this point. The effort must here be made to give at the same time a body of definite historical information, some training in the use of historical material, and some quickening of the imagination and broadening of the historical horizon. The field chosen must be large enough to give an idea of the growth of institutions and the character of historical development, yet not so extensive as to render impossible an acquaintance at close range with the men and conditions of the times; but it cannot be said that any general agreement has yet been reached as to the course which best fulfills these conditions. With rare exceptions, of which Columbia College and the University of California are the most notable, the attempt is no longer made to cover the whole range of universal history in the first course in college, as so rapid a survey has generally proved confusing and unsatisfactory; a favorite type of course is one covering the history of Europe from the close of the Roman period to the eighteenth century or, more commonly, to the close of the nineteenth. Some colleges, such as Harvard, Wisconsin, and Kansas, finding this period too long, limit the introductory course to the Middle Ages, in order to secure time for more thorough study and more careful training. In some instances, a general course in English history is given for this purpose; at other places a course in ancient history; while Cornell, Wisconsin, Pennsylvania, and some others offer two or more parallel courses for beginners, an arrangement which avoids some difficulties but loses the advantage of uniform preparation for later courses and tends to keep students too long in the elementary stage. American history is generally regarded as not well suited for this purpose, since it is commonly studied in the last year of the high school and does not offer the freshness of interest and the breadth of view desirable at the beginning of college work.

An introductory course of this kind should be taken by all college students, and most of them should be encouraged to take two or three additional courses as an essential part of their general education. For the needs of the general student every college should provide instruction in ancient history, the history of the Middle Ages and of modern Europe, English history, and American history. How far courses in these fields should be multiplied and subdivided is a matter which each institution must decide for itself, provided always that it remains possible for the ordinary undergraduate to get a fairly satisfactory survey of the general field of history without devoting an unreasonable amount of time to the subject. Some subdivision is desirable in every institution in order that students may have opportunity for the more intensive study of a period or topic, as a means to the fuller comprehension of what history is and how it is studied. It is also important that toward the close of their college work students of special aptitude for history should have access to an elementary seminary or practice course, not only for historical training and for an understanding of the subject chosen, but also as a step toward the intellectual independence which comes from forming one's own conclusions after a careful examination of all available evidence. If the topic for such a course is not beyond the powers of a good senior, its selection may well be determined by the facilities of the library and the special interest and competence of the instructor. In all questions of the historical curriculum there is great diversity of practice among American colleges, and while there is a growing tendency to pay attention to the experience of other institutions, uniformity is neither desirable nor at present attainable. Moreover, the field of history is so vast and its variety so great that it will never be possible to establish any such regularity and definiteness of order as exists in the case of courses in mathematics and natural science.

With respect to the methods of college instruction, equal diversity exists. The slavish memorizing of textbooks, once practically universal, has generally been abandoned, and the text is now supplemented or replaced by lectures, prescribed or recommended reading, and written reports, often reënforced by an outline or syllabus. Illustrative material of various kinds has been introduced, and the outline map has proved a valuable adjunct for the teaching of historical geography. Considerable use is now made of extracts from the sources in undergraduate instruction, partly for greater vividness and freshness, partly, as in the case of constitutional documents, as a means to the more thorough understanding of significant topics, and partly for exercises in the process of historical criticism and construction. The systematic use of such material at all stages of college work has been especially notable at the University of Nebraska. As a result of these changes, the textbook itself has been greatly improved in the past twenty-five years, although, for commercial reasons, school and college texts in history are as yet imperfectly differentiated.

One of the most difficult problems in the college teaching of history is that of the management of the large classes, numbering from fifty to five hundred, which have developed in all but the smallest of American colleges and for which the teachers of history and similar subjects can hardly be said to have worked out a method equal to the laboratory work which accompanies classes of this size in the field of natural science. Many colleges have adopted the so-called "Harvard system," by which the class meets together for lectures and is divided into small sections under instructors and assistants for discussion and quiz upon the lectures and the assigned reading. This method is most effective when a written test forms part of the work of the sections and when frequent individual conferences are also held. It is the most economical system and the only one which brings all members of the class into contact with the most experienced teachers in the department; but it requires for its success a larger number of thoroughly competent assistants than is usually available. Elsewhere, as at Yale, Columbia, and Chicago, the class meets only in sections, an arrangement which provides well for daily drill but cuts off a considerable body of students from any contact with men of professorial rank, as no college has yet been willing to furnish a staff of highly paid men sufficient to conduct all the divisions of so large a class. At Princeton and Bowdoin the method first described has been modified and carried much farther by means of preceptors who direct the students' reading in groups of four or five, an exceedingly costly arrangement which shows promise but has not yet been tested on a large scale with introductory courses.

The University Study of History in America. — The university study of history in the United States may be said to have begun with the original investigations in medieval institutions which were undertaken at Harvard University in 1874 by a group of advanced students under the direction of Henry Adams and which bore fruit in 1876 in a volume entitled *Essays in Anglo-Saxon Law*. An "historical seminary" for seniors had, it is true, been organized at the University of Michigan by Charles Kendall Adams (*q.v.*) in 1869, but it was of a general and elementary character and did not reach an advanced stage till ten years later. Seminary work in history was likewise a feature of the system of graduate study instituted by the Johns Hopkins University at its foundation in 1876, and after 1881, under the leadership of Herbert Baxter Adams (*q.v.*), this seminary exerted a wide and fruitful influence upon the study of American institutions and upon methods of teaching throughout the country. In 1880 Columbia University organized a Faculty of Political Science, in which the study of constitutional and legal history held an important place, and about the same time more adequate provision for advanced instruction in history was made at Cornell University, where the first distinct professorship of American history in the United States was established in 1881.

While the introduction of the seminary method was the determining element in the differentiation of the higher study of history in America, the line between college and university work has never been sharply drawn in this subject, nor is such demarcation likely in the near future, since it is possible to begin certain kinds of original investigation in college, while on the other hand the preparation of the advanced student and teacher demands a large amount of general work which cannot be completed in college and can best be carried on in the graduate school along with the beginnings of independent investigation. Accordingly under American conditions the transition from elementary to advanced work in history is more gradual than in European universities, while at the same time the antithesis between the lecture and the seminary methods of teaching is less strictly observed, many of the most profitable graduate courses being conducted by a combination of lectures, student reports, and class discussions. Free use is everywhere made of the library, indeed the freedom of access to the stack and the greater promptness of service in American libraries are points of distinct superiority over European institutions of learning; but at most American universities the resources of the library, outside of narrowly limited fields, are quite inadequate for the most advanced historical work. Another characteristic of the advanced study of history in America is the close connection maintained with economics and political science, both in the organization of instruction and in the emphasis put upon the economic and constitutional aspects of history, and subjects like economic and diplomatic history are often left to these related departments.

A well organized university department of history needs a great library and the support of strong departments in related fields; it must also offer advanced instruction in ancient, medieval, and modern history, as well as in such fields as economic history, ecclesiastical history, and the history of religion, and in the auxiliary sciences. Special attention will naturally be paid to the history of the United States and of those countries and movements most closely connected with American history. At present the universities which have the most extensive equipment of teachers and books in these various fields are Harvard, Yale, and Columbia, each with a dozen professors and assistant professors of history. Well developed graduate departments of history are also maintained by Chicago, Cornell, Pennsylvania, and Wisconsin. Illinois and Michigan also have important departments, while at Johns Hopkins and Bryn Mawr graduate work in history is definitely organized, but with a smaller body of teachers. Certain other universities do graduate work of good quality in more limited fields, notably the University of California on the history of the Pacific Coast and the University of Nebraska on the French Revolution, and most of the state universities carry candidates as far as the master's degree, if not farther. The state universities regularly omit any special treatment of church history and the history of religions. Topics which have recently obtained a footing in historical departments are the history of Latin America, which receives particular attention at Columbia, Yale, Illinois, and California, and modern Oriental history, represented most fully at Yale and to a less degree at Wisconsin, Columbia, and Harvard. Proper university provision for the promotion of research also demands the creation of traveling fellowships, for the exploration of libraries and archives at a distance, and opportunities for publishing the results of the investigations of professors and advanced students. So far Harvard is the only university which possesses regularly endowed traveling fellowships in history, but several institutions have established organs of monographic publication. The most important special series are the *Johns Hopkins University Studies in History and Political Science* (since 1882); the *Columbia Studies in History, Economics, and Public Law* (1891); the *Bulletins of the University of Wisconsin* (1894), with an Historical Series and an Economic and Political Science Series; and the *Harvard Historical Studies* (1896) and *Harvard Economic Studies* (1906). At several other universities facilities exist for the publication of historical monographs, either as members of a general series of university studies, or in conjunction with the work of state departments of history or local historical societies. The majority of such products of seminary study naturally relate to topics of American history, but excellent monographs are also produced in various fields of European, and especially of English, history. C. H. H.

History in the Secondary and Elementary Schools. — The teaching of history in the secondary or elementary schools presents two main problems: first, the relative amount of time which should be assigned to the subject, with the periods or kinds of history to which this time should be given; second, the methods of instruction. Each of these problems must be examined separately for the secondary and for the elementary school. History is a record of human experience, the rich variety of which is not indiscriminately valuable for children of all ages. The effort to find answers to these questions of matter and method appears late in the development of educational systems. This is mainly due to the fact that not until the nineteenth century was the study of history well organized in the universities.

Before the *Report of the Committee of Ten*, made in 1892, the work of the secondary schools in history was usually composed of courses in Greek and Roman history for pupils looking forward to college studies, with a brief course in English or " general " history for others. The schools with a more developed program were so rare that their practice is not significant. For the year 1889–1890 only 27 per cent of the pupils in the public secondary schools were studying history. In the elementary schools American history was generally taught in the seventh and eighth grades alone. As the majority of the pupils did not remain in school until the seventh grade was reached, they received practically no instruction in history. The subject had long been gaining more intelligent attention in France and Germany. With the organization of the *lycée* and the *gymnasium* early in the nineteenth century it was given an important place on the program of the secondary school. The recognition of its value for elementary education came later. In England, until Arnold's time, there was little systematic teaching of history in the " public " schools, and even after his day, except at Rugby and Harrow, the character of the work depended upon the interest of the individual teacher.

The *Report of the Committee of Ten* (*q.v.*) of the National Education Association, embodying the results of the Madison Conference, brought the question forward and suggested a program covering the last four years of the elementary school as well as the four years of the secondary school. The most important single influence in the movement toward the adoption of a standard program for secondary schools has been the *Report of the Committee of Seven*, of the American Historical Association, which appeared in 1899. This recommended a four years' course, beginning with ancient history in the first year, placing medieval and modern history in the second, English in the third, and closing with American history and civics in the fourth year. Effect was given to the recommendations of the committee by the action of the prominent textbook publishers in arranging for series of texts constructed according to the plan. Another influence has been the requirements fixed by colleges for entrance either upon examination or by certificate. (See COLLEGE REQUIREMENTS FOR ADMISSION.) The complete success of the movement for uniformity has been hindered by the consequences of the elective system introduced into the schools. Sometimes also the fact that many colleges have not given credit for more than one or two units of history had a similarly retarding influence. An investigation made in 1909, principally of schools in the Middle West, showed, however, that out of eighty-three schools offering a three years' course fifty-six required all three units for graduation.

Dissent from the recommendations of the Committee of Seven has usually been prompted by the desire to lay greater emphasis upon the modern period. In order to satisfy this desire a Committee of Five, partly of the same personnel, also appointed by the American Historical Association, advised that schools ready to make a change should place English history as far as 1760, with its European connections, in the second year and give the third year to a course on the last century and a half of European history.

The recent development of commercial and technical high schools has rendered necessary a course adapted to their requirements. For them emphasis should be put upon the history of the arts and of trade. The interests of the two are also distinct, because, although the achievements of the Greeks and the Romans, and, in a measure, of medieval peoples, are instructive to students of certain technical arts, students of commerce will find the modern period the most important. Both should be taught to place the special aspects of life which they study in a true historical setting, while at the same time they should not forget other phases of history which explain the general growth of civilization.

The attempt to construct a standard course for the elementary schools has been beset with even greater difficulties, because many diverse authorities must be brought into harmony, and because of excessive assignments of time to other studies, especially geography. Typical solutions of the problem have recently been presented by the University of the State of New York in a *Syllabus*, by the teachers of the Horace Mann School in their *Elementary School Curriculum*, by the Chicago University Elementary School, by the Indiana State Board of Education, and by the Committee of Eight of the American Historical Association.

The New York *Syllabus* divides American history into two cycles, the first, principally in a series of biographies, occupying the fifth and the sixth years, the second, with a narrative treatment, occupying the seventh and eighth years. The plan adopted in the Chicago University Elementary School is the most radical departure from traditional arrangements of program, and is based on the attempt to develop the pupil's historical sense in connection with his own industrial activities or those of the community in which he lives, and without much attention to chronological sequence. The curriculum suggested by teachers of the Horace Mann School, after providing stories and exercises drawn from primitive life for the youngest children, begins at the third grade with work on the Phœnicians, as typical of ancient trade and adventure, and passes by a natural transition to the stories of Columbus and of Hudson, and to the early history of Manhattan. In the fourth grade there is a study of the typical men of America, closely correlated with the study of geography. This is followed in the fifth grade by Greek and Roman history, and in the sixth by medieval history, passing over into the work of the discoveries and colonizers, in order to show the movement out of which America grew and to emphasize the fact that American civilization did not have its beginnings in the first settlements. In the seventh grade, which is the final grade, there is a study of American history from the struggle between the French and the English for control in America to the present day. The program of the Indiana State Board of Education offers certain similarities to this course, although it gives only part of one grade to stories of primitive life, follows these by stories of American heroes, emphasizes the heroes of Hebrew history as well as those of Greece and Rome, and gives the sixth year to English history, followed by two years of American history and civics (*q.v.*).

The plan of the Committee of Eight was based on the conviction, shared with the framers of the courses already described, that in teaching American history too little account had been taken of the European background or of the origin in Europe of American civilization. The plan falls into two parts, the first suggesting simple tales and descriptions of types of life easily intelligible to children of the three earlier grades, developing into a biographical treatment of American history in grades four and five. In the second part is outlined a course, continuous chronologically, for grades six, seven, and eight. Two thirds of the time of the sixth grade is given to what may be called an elementary introduction to the study of American history. Its topics include typical characters, stories, ways of living, selected from the most characteristic periods, beginning with the age of the Greeks and closing with the age of Columbus. In the later portions of the course stories and descriptions from the European background are introduced wherever this makes the setting of American history more intelligible.

In France and Germany the secondary school, *lycée* or *gymnasium*, gives instruction in history throughout a nine years' course. The course corresponds to a possible course in our schools running from the fifth grade through the elementary school, the secondary school, and up to the third college year. History is also given in elementary schools distinct from the *lycée* and the *gymnasium*, and is parallel, therefore, to the first part of the secondary school course. In the elementary school the content is confined more exclusively to the national history and omits ancient history. The last seven years of the secondary course are divided into two cycles, one of four and one of three years, thus including two journeys through the field from ancient times to the present day. In the second cycle of the French course, if the pupil is on the classical side, *i.e.* has Latin and Greek, or Latin and the "living" languages, he devotes four hours to history, two to ancient and two to modern; if he takes the sciences with either Latin or the living languages, he devotes two hours to modern history. Except at this period of the course, the time given to history, both in German and French schools, averages three hours a week and the work is correlated closely with geography.

In England the average amount of time given to the subject is two hours a week in both the preparatory years and in the secondary school proper. On account of the variety of type in the organization of the English schools it is difficult to summarize the practice. The most authoritative recommendation is presented in Circular 599, published by the Board of Education in 1908, and includes, for the first stage, with children up to the age of twelve, stories from the history of England and of other countries, centering about great characters like Charlemagne, Columbus, and Washington, as well as famous Englishmen; for the ages between twelve and sixteen, a chronologically continuous course in English history with the European connections; during the final years, classical history for students going to the universities, for others English or modern continental history. The Circular records the gradual falling off in the practice of introducing a special period for more intensive study, and argues that there should be judicious selection all the way through of incidents and characters for special emphasis. The Circular also criticizes the concentric method by which in some schools the whole subject of English history is gone over each year summarily. In too many instances history is lumped in the program with "English subjects." The general influence of the type of questions asked in various public examinations, in competition for prizes, honors, etc., has been to retard the development of a plan of study satisfactory to the more progressive teachers.

From the practice abroad, as well as from the character of the efforts to promote the teaching of history in American schools, it is evident that the best opinion is in agreement upon the necessity of making the instruction continuous throughout the pupil's school career. Only by this means is it possible to form in his mind a useful framework of historical events and to train him to think of events historically.

Time is also needed for the growth of interest and the formation of a habit of reading historical books. In the opinion of a recent French minister of public instruction the habit of reading historical books is an important element of the reading habit, which, next to the habit of observation, should be the aim of popular education, and without which the pupils are in danger of falling into illiteracy after they leave school.

Methods of Teaching. — Upon methods of teaching there is less agreement than upon questions of program, although for the attainment of the aims of the subject an effective method is more important than the choice of any particular period for study. If the method of teaching is not effective, the subject is discredited as an instrument of education. As the matter now stands, the statement that a pupil has had a course in ancient or medieval and modern history, means much, little, or worse than nothing. The most urgent need of the present time is the adoption and the general practice of a well-considered method of teaching the subject. In the management of subjects which are already well organized pedagogically, like English, chemistry, or Latin, teachers know what is expected the first month, the first term, the first year; they realize what are regarded as the essential elements of a good method. But the teacher of history may confine his work wholly to the explanation of the paragraphs of the textbook, or he may assign selections for reading in other books, or he may also utilize collections of source material. He may train his pupils in the use of notebooks or he may never allude to them. What he shall decide to do seems to depend generally upon his individual preference. The well-trained teacher is capable of solving the problem for himself, but many others are groping about among haphazard experiments or apathetically following methods sanctioned by local tradition.

In Germany there is a recognized method of teaching history. This is true of France also, although French teachers differ among themselves in regard to the function of the textbook. In Germany reliance is placed mainly on the teacher and the instruction is principally oral. Many teachers even object to the use of a notebook during a class exercise, because they wish the attention of the pupils concentrated upon what they are saying. By a process of questioning and repetition they work the facts literally into the pupil's mind, so that he is gradually enabled to construct so solid a framework of the past that it is serviceable for all his future work whether in the university or elsewhere. Books of simple outlines, or *Leitfaden*, are used to supplement the oral work. So complete is the dependence upon the teacher that few or no references are given to historical works and there is slight use of selected sources. This has been criticized as not offering the pupil enough training for independent work in history and as being in one respect a poor preparation for the freedom of university work. Such reliance upon the teacher is possible only because of the thorough training insisted upon by the State in the case of every teacher. In both France and Germany the subject is intrusted almost wholly to special teachers. Although the French use the textbook more than the Germans, they generally go over the lesson in a carefully prepared lecture which the pupils record in notebooks. The reason for this, when a textbook is also used, is the need of placing the right emphasis and of stimulating the attention. It is believed that by such a method the dull pupil obtains more than if he is expected to master without direction the topics assigned. The French do not make extensive use of selected sources or of other reading references. In England, with no central controlling authority, the methods of work show less uniformity than those of France or Germany, but where the subject is well taught it is likely to include excellent training in writing up topics on the basis of an intelligent use of reading references.

European methods of teaching history should not be transferred mechanically to American practice, but acquaintance with them emphasizes the value of a standard of work and directs attention to the elements of the problem. What may be suited admirably to the needs of the German boy in the *gymnasium* or the French boy in the *lycée* may not take sufficient account of the more precocious individuality of the American boy. An adequate method must be the outcome of a careful study of the child and a wise consideration of the benefits which he should derive from his work in history. The study of history should give him not merely a body of information, it should affect his attitude towards the world and train his mind for the successful search for certain kinds of truth.

In the elementary school the question of method, like the question of program, is partly conditioned by the fact that many pupils leave school at the end of the fifth grade. For such a pupil the most that can be hoped is some acquaintance with the history of the United States through stories, primarily biographical, and pictures of life and customs. Stories of the great world heroes should be added. At this stage it is upon the never-failing interest of the story well told that the main reliance must be placed. The teacher should be trained for his work as the librarians of children's libraries are trained for the "story hour." The most usual defect of the story is its lack of vivifying details, which enable the comparatively feeble imaginative power of the child to form a picture of the incident as of something that actually happened. Children of the fourth and fifth grades are also beginning to read for themselves, and they should be led to read stories from history. It is unnecessary to emphasize the need of correlating this work with what is done in English and in geography.

In the higher grades of the elementary school the pupil should be enabled to form a picture, fairly accurate in its details, and in chronological order, of the principal events of American history and of its European background, in order that it may be a serviceable framework for later historical knowledge. More emphasis should be laid upon reading, in books furnished by the school library or by local public libraries. Some use can also be made of original sources, with the aim of illustrating facts easily within the comprehension of children of this age. Selections which illustrate two sides of a controversy, like that between Parliament and the colonies after 1765, or between the North and the South before the Civil War, will train pupils, who are beginning to read the newspapers, to read more intelligently and with some effort of judgment. There should be practice in making simple maps, explaining geographically an historical situation. Outline maps may be used for this work. Pictures offer an opportunity not only for awakening interest, but also for giving training in observation.

The problem of method for the secondary school is more complex, because the element of training should receive greater emphasis. The most obvious requirement of a course is the mastery of the contents of the textbook. To attain this result there are needed, besides the ordinary recitation exercises, the preparation of outlines and summaries, the construction of what the English call "date strips," and the preparation of reviews. The teachers most interested in the improvement of the teaching of history would add some reading from historical books other than the textbook, the study of selected sources of a simple and clearly illustrative character, and the making of reports upon topics with the use of several books of reference. There must also be the construction of maps. How many of these exercises the individual teacher may be able to embody in any particular course depends upon the special conditions of the school, that is, the amount of other work demanded of the teacher, the existence of a school or public library, the number of available historical maps, etc. Each exercise should be repeated at least once, because the first attempt serves principally to make clear the difficulties. There should be orderly progress in the manner of work from the beginning to the end of the course. The pupil is studying history in order to learn how to study history as well as to acquire a body of historical facts. Each exercise should have relation to its predecessor and to what is to follow.

The teacher's first task should be to construct a calendar of the course, apportioning the work of each day, and indicating at what stage any particular exercise is to be attempted. An examination of the textbook will show what topics are adequately treated and upon what topics there must be supplementary oral explanations or informal lectures. It is apparent that an exercise in constructing summaries should be inserted after an epoch of marked characteristics has been studied. Upon the completion of the study of a long and complex process an outline, chronological or topical, will be useful. Teachers may wish to use a simple outline for each day's work, but the construction of such outlines should not be required every day of all the class, for this work would soon become mechanical and wearisome. A review of the geographical relations of the subject will show at what points illustrative maps should be constructed. Certain topics should be studied partly through the medium of pictures. (See Visual Aids to Teaching.) If there are to be reports on long readings, the place of these will be determined by the interest of the topic or incident and the availability of books on the subject. The same is true of topical studies, of which there should not be more than two or three during the particular course. The results of these exercises should be embodied in the pupil's notebook. They should be written on sheets of paper which may be inserted without copying in a loose-leaf notebook. The pupil will need careful instruction upon the manner of preparing this written material for the notebook.

The teacher may not be able to insert upon the calendar more than an indispensable minimum of exercises, because such exercises require efficient supervision, and the burden upon the average teacher is already heavy. The way to meet the difficulties of the situation is to agree upon what this indispensable minimum includes, and from it as a basis work steadily toward the desirable. H. E. B.

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HISTORY OF EDUCATION. — Its Value. — An appreciation of the value of the study of educational traditions and customs is united with the tardy recognition of culture history in general. The earlier study of historic aspects of education was connected either with particular institutions, chiefly universities, or with the philosophical interpretation of education. Recently, however, a wider significance is recognized both because of the function of the study in professional education and of its cultural value. Certain of these reasons may be indicated briefly. In the first place the recent strong emphasis upon the genetic approach has brought into clearer light the significance of the historical; if a large proportion of our educational ideas and practices have no other support in the present but a historical or traditional one, it is quite essential to the teacher to know something of the origin and significance of these customs. Again as a guard against the danger of extremes in moving away from the restrictions of inherited standards, such a study is of value. The waves of opinion which are popularly called "fads and frills" can be minimized by a study of past experience with similar schemes. As an instrument for broadening the interests and sympathies of teachers, often far more restricted than those of the children whom they teach, this study is of great value because of the broad conception and wide social relation of education which it gives. When the Herbartian conception of education as the development of many-sided interests upon the part of the pupil is considered, the importance of the same development for the teacher is evident. The greatest professional significance is that the contributions of historical study clarify standard and ideals. Where, as in teaching, no definite purpose, adequate or satisfactory, can be gained either from a knowledge of the subject matter imparted or from the mind of the child taught, some formulation of ultimate standards is essential. The study of the relation of school work to social needs and various historical stages contributes much to this end. On the technical side, much is to be said for the training in the use of the comparative or historical method as well as for the experimental through psychology or the logical through philosophy. On the cultural side much could be argued for the value of a subject which represents society's conscious attempt to perpetuate its achievements of the past and to realize its aspirations of the future. It is needless to add that these values are not to be found if the subject is to be conceived as a study of schoolroom devices or the pedagogical ideas of a few leading teachers or philosophers. It is only reached when treated, as by Plato and Aristotle, as an essential part of the study of society represented in its highest conscious effort, — the culmination of the social process.

Historical Development of the Subject. — The study of the history of educational thought and practice did not receive serious attention until the end of the eighteenth century, when it was stimulated by two movements. The first of these was the general interest in the past and a desire to estimate human progress by comparison with the past. Secondly, an impetus was given to a study of antiquity by the revolutionary and rationalistic movements of the age which refused to recognize the influence of the past. Hence the desire by the opponents of these movements to trace the evolution of human progress and establish some standards and norms to counteract what were regarded as revolutionary proposals.

Probably the earliest history of education as such was the *Traité des Choix et de la Méthode des Études* (1675) by Claude Fleury, who was associated with Bossuet as instructor to the royal children. This work was translated into English in 1695 by S. Keble. As Fleury states in the opening sentences of his work that "to understand well the Order of our publick Studies, it seems to me Advisable to go to the Fountain-head; that so we may see whence every part is deriv'd down to us; how the whole body of these Studies has been form'd in the Succession of many Ages." The first part, about fifty pages, is devoted to a history of studies down to the "Restoration of Humanity." The chief interest in this part is perhaps a recognition of the influence of Arabian and Hebrew thought on the Middle Ages. Otherwise the work, as might be expected, is somewhat sketchy. The second part is devoted to a theory of the curriculum. In the century following there appeared many histories of individual schools, but no connected history of education. Among these may be mentioned: Ludovicus, G., *Historia Rectorum Gymnasiorum, Scholarumque celebriorum* (Leipzig, 1908–1911); Biedermann, *Acta Scholastica, Altes und Neues von Schulsachen* (Halle, 1752–1755); Burckhardt, *De variis Germaniæ Scholarum a Caroli M. tempore usque ad Sæc. XVI Mutationibus* (1715); Schöttgen, *De Statu Scholarum ante Reformationem* (1717); Ulrich, *Pragmatische Geschichte der vornehmsten Katholischen und protestantischen Gymnasien und Schulen im Deutschland* (1780). The author of the last work hopes by a complete account of the qualities and defects of certain schools to lead to improvement and greater perfection of teaching method and discipline in the schools of his day. The work gives an account, valuable because contemporary, of Basedow's theory of the Philanthropinum (f. 1774), a history of the Fürstenschulen of Saxony, and of schools in Austria and Bavaria. It is interesting to note, as bearing out the introductory statement, that the work which has usually been regarded as the first history of education, C. A. Mangelsdorf's *Versuch einer Darstellung dessen was seit Jahrtausenden im Betreff des Erziehungswesens gesagt und gethan worden ist* (Leipzig, 1779), was prompted by opposition to the educational thought represented by Basedow. "If one desires," he writes, "to form a correct judgment on new proposals for improving education, one must not only know what has been done in various directions, but also what has been said." This work was followed by the *Geschichte des Schul- und Erziehungs-Wesens in Deutschland von der Einführung des Christenthums bis auf die neuesten Zeiten*, by Fr. E. Ruhkopf (Bremen, 1794). This is an attempt to record the most important steps in the origin and progress of German education. The work is based on source material, and is valuable, bibliographically, for the references to earlier books on education, which, however, contained nothing but biographies, lists of births and deaths, or collections of writings. The author refers to a plan for a History of Education published by Schöpperlin in *Magazin für Schulen* about 1770, which was never carried out. He takes a broad view of education, and recognizes the intimate connection of education with the church, politics, and literature, and claims his book to be the first attempt in a new field. A significant step in advance was made by Fr. H. Christian Schwarz, who in 1802 had published *Erziehungslehre*, to which he added in 1813 *Geschichte der Erziehung in ihrem Zusammenhang unter den Völkern von alten Zeiten her bis aufs neueste*. A new edition in 1829 was preceded by the history, since a true conception of present problems is impossible without a knowledge of what has already been done. He is opposed both to the view which looks upon the past as perfect because it is past, and to the view "which holds that truth has never yet been discovered and that every moment brings something better than before." History of education is a branch of the history of civilization, and while giving an account of the past, affords insight into the present. The work is comprehensive, and deals with the educational history of most of the nations of antiquity up to the philanthropinistic movements and the new education. The importance of the history of education was also recognized by A. H. Niemeyer, who added a historical section (*Überllick der allgemeinen Geschichte der Erziehung und des Unterrichts nebst einer specielleren pädagogischen Charakteristik des achtzehnten Jahrhunderts bis auf die neuesten Zeiten*) to the later editions of his *Grundsätze der Erziehung und des Unterrichts* (1796). Here the history of education is given in outline up to the eighteenth century, which receives more detailed treatment. A separate work, *Originalstellen griechischer und römischer Klassiker über die Theorie der Erziehung und des Unterrichts* (1813) serves to supplement the earlier summary. While the author recognizes the breadth of the subject as an account of the theory of education, the leaders, institutions, and writings of the past, his work gives little more than biographical sketches of educational leaders.

The practical purpose of a study of the history of education, emphasized by Schwartz, was recognized in a number of histories written about 1830. Thus A. Kapp, in *Commentatio de historia educationis et per nostram ætatem culta et in posterum colenda* (1834) would include a study of all types of education in addition to the school, for " the correct historical account of a science or art leads to a clear knowledge of the really true standpoint." He himself was the author of *Platons Erziehungslehre* (1833) and of Aristotle's *Erziehungslehre* (1837). So in the forties most books on the theory of education were preceded by some historical account; as examples may be cited Gustav Braun, *Grundzüge der Erziehungslehre* (1849), and Rosenkranz, *Die Pädagogik als System* (1848).

The history of education was not uninfluenced by the Hegelian philosophy of history. Hegel's own *Lectures on the Philosophy of History*, dealing as it does with the development of human *Geist* or spirit toward self-realization, may to that extent be regarded as a history of education in its broadest sense. Several works accordingly appeared in this field with a preconceived law of progress to serve as a standard of judgment. Fr. Cramer devoted his lifetime to the study of history of education, but never completed the work. He published in 1832 *Geschichte der Erziehung und des Unterrichts im Altertum*, which in 1839 was brought down to the time of Lucian; and in 1843 appeared his *Geschichte der Erziehung und des Unterrichts in den Niederlanden während des Mittelalters*. He regards as the main aim of education not its purely practical aspect, but a knowledge of the educational means of ancient times, what the human efforts were in all fields, and how the divine idea to bring the human race to perfection has developed and revealed itself in human progress. History should trace the influence of divine providence in the direction of human affairs without any subjective additions. With K. Schmidt, *Geschichte der Pädagogik dargestellt in weltgeschichtlicher Entwickelung und im organischen Zusammenhange mit dem Kulturleben der Völker* (1860–1862), the idea of the God-man is the central point in world history; progressive evolution is accordingly the embodiment of God in man, and the history of education attempts to accompany the spirit of man through the struggle for freedom At the same time this work contains a great deal of material and a full bibliography.

The work of Karl von Raumer, *Geschichte der Pädagogik vom Wiederaufblühen klassischer Studien bis auf unsere Zeit* (1847), is important in a historical survey, for this work more than any other has exercised an influence on the histories of education written in English. Von Raumer began his studies with a course of lectures at Halle in 1822, and continued at Erlangen from 1838 to 1842. While he recognizes that a history of education must keep in view the cultural ideal of the time and show how this ideal was worked over into the practical field of education, he devotes the greater part of his work to biographies of educational leaders as the embodiment of the ideals of their day. Nor does he accept the theory that a history should be an objective account of facts, for if the history of education, for example, is to have any value, it must be approached with subjective problems and standards.

More comprehensive than any of the preceding works is the *Geschichte der Erziehung von Anfang an bis auf unsere Zeit* (1884–1902), issued by K. A. Schmid with the collaboration of many scholars, each one a specialist. The work represents the modern conception of history as an account of facts as they really were and in their actual connection. Systems of education remain unintelligible when freed from the general intellectual atmosphere in which they are set. So extensive a work would have been impossible for one man alone, and it is representative of another modern tendency, not to issue general histories but monographs on special topics and publication of source material. Since Schmid most of the general histories of education have merely been textbooks based on previous works, but an exception must be made in favor of Paulsen's *Das deutsche Bildungswesen in seiner geschichtlichen Entwicklung* (Leipzig, 1906), which, in spite of its short compass, gives a good account of German education as part of the development of German culture. It was pointed out earlier how the first histories of education were histories of individual schools. Valuable special studies were A. Heppe's *Geschichte des deutschen Volksschulwesens* (1858); Grasberger, L., *Erziehung und Unterricht im Klassischen Altertum* (1864); Kehr, K., *Geschichte der Methodik des deutschen Volksschulunterrichts* (1877); Paulsen, F., *Geschichte des gelehrten Unterrichts* (1884). Since then the number has increased rapidly, the most scholarly and valuable series being the *Monumenta Germaniæ Pædagogica* (*q.v.*), edited by Kehrbach and issued since 1889. Under Kehrbach's influence was organized in 1890 the *Gesellschaft für deutsche Erziehungs- und Schulgeschichte* for systematic research into the local educational history and the collection and publication of records bearing on education in German-speaking countries. School ordinances, textbooks, biographies, diaries, pictures, etc., are investigated. In addition much local research is carried on, as an example of which may be cited H. Heyd, *Geschichte der Entwicklung des Volksschulwesens im Grossherzogtum Baden* (1894–1897), done under the auspices of the Elementary Teachers' Association of the duchy. The following series explain their purpose without any further description: Fr. Mann, *Bibliothek pädagogischer Klassiker* (1869–1895); G. A. Lindner, *Pädagogische Klassiker;* Karl Richter, *Pädagogische Bibliothek;* G. Fröhlich, *Die Klassiker der Pädagogik;* E. Friedrich, and H. Gehrig, *Die pädagogischen Klassiker;* R. Vormbaum, *Evangelische Schulordnungen des 16., 17., und 18. Jahrhunderts;* A. Richter, *Neudrucke pädagogischer Schriften;* H. Schütze, *Auslese aus den Werken berühmter Lehrer und Pädagogen des Mittelalters;* Aug. Israel, *Sammlung selten gewordener pädagogischer Schriften des 16. und 17. Jahrhunderts;* Kurz, F. X., *Bibliothek der Katholischen Pädagogik;* Von Ufer, *Internationale Bibliothek für Pädagogik und den Hilfswissenschaften; Sammlung der bedeutendsten pädagogischen Schriften.* For the history of the universities excellent material can be found in the work of W. Erman and E. Horn; *Bibliographie der deutschen Universitäten* (Leipzig, 1904), a comprehensive list of works dealing with universities up to 1899. To this may be added the monograph series edited by Th. Kappstein, *Die deutschen Hochschulen* (Berlin, 1907–).

English. — Histories of education in English have in the main followed the work of Von Raumer as a model. Few of them have even attempted to trace the development of education in its broadest aspect as a branch of the history of civilization, and the majority have been content to give accounts of the educational leaders and their theories. Probably the earliest systematic survey in English was given in a small volume issued in *Harper's Family Library* in 1842. The author, H. I. Smith, Professor of German Language and Literature in the Theological Seminary at Gettysburg, Pa., was evidently familiar with the earlier German works. The volume gives a very creditable survey of educational development, and is superior to many published much later. Barnard, while in general covering the whole of the history of education in different issues of the *American Journal of Education*, either based his contribution on German sources or translated parts of Von Raumer. *German Teachers and Educators* (1878) is an expansion of the *German Educational Reformers*, collected from the *American Journal* and published separately in 1863, being thus probably the first history of education in English. This had been preceded in 1859 by the translation of Vol. IV of Von Raumer, *German Universities.* A similar collection on English education from the *American Journal* was made in 1876, when two volumes, *English Pedagogy, The School and the Teachers in English Literature,* were published. This work is of great value for the collection of source material and the light thrown on English education by the quotations of writers who were not professional educators, and has hardly been surpassed up to the present.

Another work which has had and still has a great vogue is R. H. Quick's *Educational Reformers* (1868), also based largely on Von Raumer; this was expanded in 1890. Here, too, the treatment is confined almost entirely to education of the schoolroom. The aim which Quick had in mind was to acquaint practical men in education with " what has already been said and done by the leading men engaged in it, both past and present " (1868); in a later edition (1890) the aim is stated to be " to select a few people especially worth knowing about and to tell concerning them in some detail just that which seemed to me specially worth knowing." As professor of education in the College of Preceptors, Joseph Payne (*q.v.*) delivered the first course of lectures on the history of education in English, which aimed at nothing more than a treatment of the art of education at different periods. In general the emphasis which was prominent with the German historians is also found here, to understand the history of the subject as an aid to the solution of modern problems. Few have recognized the comprehensiveness of the educational influences, or, if they have, as Seeley did who saw that the " details . . . embrace a study of the history and environment, of the internal, social, and religious conditions of the people," they have failed to carry them out. The following works which appeared before 1900 may be mentioned: Browning, O., *Educational Theories* (Cambridge, 1881); Painter, F. V. N., *A History of Education* (New York, 1886); Williams, S. G., *The History of Modern Education* (Syracuse, 1892); Munroe, J. P., *The Educational Ideal* (Boston, 1895); Seeley, L., *History of Education* (New York, 1899). The appearance of Thomas Davidson's *A History of Education* in 1900 marks an epoch in the conception of educational history in English. This is the first work which is not mainly biographical, and is an attempt to trace educational development as a phase in human evolution. But while trying to avoid the narrowness of earlier histories, Davidson's book errs somewhat in exaggerating the other side without giving a clear definition of education. An attempt to strike the mean by making " evident the relation between educational development and other aspects of the history of civilization and to deal with educational tendencies rather than with men," is made in Monroe's *Textbook in the History of Education* (1906). While not neglecting the practical aim, to show connection between theory and school practice, and the influence of the past on the present, the work has the advantage of constant reference to source material.

Very little of the nature of the German monographs has been done in English, nor is the interest in the history of education so strong either in England or America as in Germany. A valuable contribution on Education in Early England was made as early as 1867 by F. J. Furnivall in the introduction to the *Babees Book;* but with the exception of Leach's *English Schools before the Reformation* (1896), *Educational Charters* (1911), and his contributions to the Victoria County Histories of England, de Montmorency's *State Intervention in England*, and Watson's *English Grammar Schools to 1660* and *Beginnings of the Teaching of Modern Subjects in England,* little has been done toward a comprehensive history of English education; the series of monographs on the colleges of Oxford and Cambridge, and several on the large Public Schools may here be mentioned. In America the field is only just beginning to be studied. P. M. and I. L. K.

See Education, Academic Study of.

France. — The history of education is hardly taught in France, and only figures in the curriculum of normal schools. A ministerial decree of Aug. 3, 1881, introduced this subject into the course for the third year in the following terms: "History of Pedagogy; the chief educators and their theories; Analysis of the most important works."

In the universities there are no special chairs in the history or science of education except where occasionally the professors of philosophy or the instructors, few and far between, who fill a chair in the science of education, devote their courses to the history of a period in education or to some educational topic. It was in this way that the present writer as professor of philosophy in the faculty of letters of the University of Toulouse, took education as the topic of his lectures, which resulted in the two volumes on the *History of Educational Theories in France.*

In the secondary schools, *lycées* and *collèges*, no attention is paid to the history of education, but the candidates for the various *agrégations* (*q.v.*) must study at least some sections. The decree of July 26, 1900, which regulates the requirements in the practice of education which candidates must attain to be permitted to present themselves for the competitive examination distinguishes between the practical apprenticeship as assistants in a number of classes in the *lycées* and preparation in theory by attendance at twenty conferences dealing with secondary education in general, its history and organization in France and abroad.

Thus the history of education is not a regular subject of instruction in France. For a long time those who were inclined to study it had only the German authorities at their disposal. Thus Fritz, in giving a survey of the works on history of education (in *Esquisse d'un Système complet d'Instruction et d'Éducation et de leur Histoire*, Vol. III, ch. I (Strassburg, 1843), refers in the main to German works and only mentions one in French (Guizot, *Essai sur l'Histoire et sur l'État actuel de l'Instruction publique en France,* Paris, 1816). A year after Fritz's work there appeared *Histoire critique et législative de l'Instruction publique et de la Liberté de l'Enseignement en France* by H. de Riancey (Paris, 1844), which aimed with the help of a survey of educational history to establish some standards for further reform. But the contributions to the subject in France were very small until the eighties, since when a large number of works, the majority dealing rather with French history, and particularly the period during or subsequent to the Revolution. The standard work until this period was that of Jules Paroz, *Histoire universelle de la Pédagogie* (Paris, 1867).

The time has gone by when the efforts of the Revolution in educational matters can be ignored, or when a French university scholar, like Théry, in his *Histoire de l'Éducation en France,* can open the chapter on the Revolution with these contemptuous words, *On n'étudie pas le vide, on n'analyse pas le néant.* It is precisely this period in our history, which with the Report of Talleyrand to the Constitutional Dynasty, of Condorcet to the Legislative Assembly, of the plans of Mirabeau, Lakanal, Daunou, has been one of the most productive, preparing the ideas which have been assured their accomplishment in the Third Republic. Collections of important documents have been published which enable scholars to investigate the educational part; of these the most notable is the work of Gréard (*q.v.*), *La Législation et l'Instruction primaire depuis 1789 jusqu'à nos Temps,* including laws, decrees, and ordinances preceded by an introduction. Gréard was one of those who contributed greatly to spreading a taste for the history of education in France, especially by his excellent studies of the most celebrated educators, Mme. de Maintenon and Mme. de Rémusat, and by his introduction to Fénelon's *Éducation des Filles.* Mention must also be made of M. F. Buisson, the second edition of whose *Dictionnaire de Pédagogie* has just appeared, giving a careful treatment of the history of education and articles on the most important educators. The author's own *Histoire de la Pédagogie* has been translated into English by W. H. Payne, as well as a few volumes of his series *Grands Éducateurs* (*Pioneers of Education,* London, 1908).

G. C.

Its Place in the Curriculum. — See Education, Academic Study of.

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Schmid, K. A. *Encyklopädie der gesamten Erziehungs- und Unterrichtswesens,* s. v. *Pädagogik, Geschichte der.*

HITCHCOCK, EDWARD (1793–1864). — College president and scientist; was born at Deerfield, Mass., on May 24, 1793. He received his education in private schools and at Yale College. He was principal of the Deerfield Academy (1815–1818), professor of chemistry and natural history in Amherst College (1825–1844), and president of Amherst College (1844–1854). He served as state geologist of Massachusetts, and was one of the founders of Mount Holyoke College (*q.v.*). His writings include *Life and Labors of Mary Lyon* (1852), *Reminiscences of Amherst College* (1863), and several works on geology and botany.
W. S. M.

See Amherst College.

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Tyler, W. S. *History of Amherst College.* (Springfield, 1873.)

HOAR, LEONARD (1630–1675). — Third president of Harvard College, and a prominent clergyman and physician; was graduated at Harvard in 1650, and subsequently took a degree in medicine at the University of Cambridge, England. He succeeded Chauncy as president of Harvard in 1672. "As a scholar and a Christian he was very respectable, but being deficient in the spirit of government, and falling under the displeasure of a few men of influence in the neighborhood, the students were thus encouraged to array themselves against him, and his situation was rendered so unpleasant that he was under the necessity of resigning his office March 15, 1675." He advocated technical and industrial education as a part of the college course.
W. S. M.

See Harvard University.

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HOBART COLLEGE, GENEVA, N.Y. — The successor of Geneva Academy. In 1860 the present title was adopted. Though largely aided by Protestant Episcopal Societies and individuals, the college is nonsectarian in administration. Hobart College is among the institutions originally accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*). The institution confers the usual bachelor's degrees in arts, philosophy, and science, and the degree of A.M. for one year's graduate study in residence. Admission is by examination or certificate from an approved four-year high school. In September, 1908, the trustees of Hobart College opened William Smith College for the separate instruction of women, founded through the gift by William Smith, Esq., of Geneva, of $475,000. The work of the two colleges is conducted independently by a common faculty upon whose recommendation the corporation of Hobart College grants to the students of both institutions the same degrees. There was in 1910–1911 an enrollment of ninety men and thirty-eight women, with a faculty of twenty-three members.
C. G.

HOBART, JOHN HENRY (1775–1830). — Founder of Hobart College (*q.v.*), was educated at the University of Pennsylvania and Princeton University. His life was devoted to the ministry and episcopacy of the Protestant Episcopal Church. In 1821 he established an academy and divinity school at Auburn, N.Y., which four years later became Hobart College. He was the author of several works on religion and religious education.
W. S. M.

See Hobart College.

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HOBBES, THOMAS (1588–1679). — Son of an illiterate clergyman of the English church. He was brought up by an uncle, a glovemaker in Malmesbury. Hobbes' education began at four years at a school in Westport, where he mastered Latin and Greek at an early age and was able to translate the *Medea* of Euripides into Latin iambic verse before he was fourteen. Entering Magdalen Hall, Oxford, at fifteen, he received his bachelor's degree in 1608. He seems to have had little sympathy with the pronounced Calvinism which prevailed in Oxford under Dr. Wilkinson, and was left very much to his own devices in his university course. Later he became tutor to the son of the Duke of Devonshire and throughout his life retained his connection with the family, with the exception of two breaks. During the Protectorate he was appointed tutor of the Prince of Wales, then in exile in Paris, where Hobbes became a member of the learned coterie which gathered about the genial Père Mersenne. He also traveled much in Europe and acquired considerable acquaintance with the mathematical and physical sciences and philosophy of the continent. His devotion to the cause of the English monarchy and nobility, however, rendered him unpopular among the leaders of the Puritan uprising, and gave a decidedly political cast to all his more important speculations, thus illustrating a characteristic tendency of English philosophy. For if Hobbes be "the father of English psychology," he also led the way in teaching that intellectual activity should, in aim and application, be practical.

Not long before the opening of the Long Parliament (1640) he wrote his works entitled *On Human Nature* and *De Corpore Politico.* At Paris he wrote others, including his masterpiece, *Leviathan* (1651), which is a treatise on social polity. It was, therefore, not until his fiftieth year that the germ of his system began to fructify, in which the following points are to be noted: (1) Hobbes sought a philosophical foundation for his doctrine in the idea of motion. With this as a starting point he believed that the whole body of knowledge could be disposed of in three sections under the headings of Body, Man, and Society. (2) Accordingly, in the work *De Corpore*, the idea of body is examined. Here he anticipated Leibnitz by attributing an atomic structure, endowed with potentialities of feeling, to matter. He explained natural or physical phenomena in terms of the universal laws of motion, as motion had been mechanically explained by Galileo and others. (3) In *De Homine* he sought to deduce all subjective experience from sense, as sense is physically determined by the body and its motions. All knowledge, therefore, grows out of sensations. After sensation there remains behind the memory of it, which may reappear in consciousness, and, aided by signs (words, general notions, definitions, and mathematical formulæ), be communicated to others. All thought is merely the addition and subtraction of sense perceptions. (4) In *De Cive* he attempted to bring both society and man within the same principles of scientific explanation as he found applicable to nature, being the first Englishman to make such an attempt. This part of his doctrine starts with the idea that all human beings are at war with each other. But this state of things is so unsatisfactory that there is all the more need of an absolute ruler, king or assembly, whose authority shall be law and to which all are compelled to render unconditional obedience by formal contract. Right and wrong are thus merely the conduct which the State sanctions or punishes. Even religion is a State-regulated convention, from which there is no appeal.

The great work of Hobbes, *Leviathan,* is an elaboration, in a more popular form, of his theory of the commonwealth, and it is in this work that he touches on the question of education. For in it he attacked violently the universities and their systems, maintaining (1) that by their allegiance to the Puritan cause they were subverting public order; and (2) by their adherence to the old learning they were working social mischief. A bitter controversy was aroused by these charges, which Dr. Wallis, of Oxford, succeeded in meeting. As a reply to Wallis he published his *Six Lessons to the Professors of Mathematics* (1656), in which he explains his anti-Euclidean view of geometry. This he followed by other smaller works on the same subject, written in a controversial style, which, however, did not add greatly to his reputation as a philosopher.

Hobbes was a man of immense energy, untiring activity, and regularity of life. Some idea of the range of his interests can be gathered from the fact that he translated Thucydides and at eighty-five turned four books of the *Odyssey* into English rhymes, adding later the *Iliad,* to which he prefixed an essay on the nature of heroic poems. H. D.

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Woodbridge, F. J. E. *The Philosophy of Hobbes in Extracts and Notes collected from his Writings.* (Minneapolis, 1903.)

HOBY, SIR THOMAS (1530–1566). — English diplomatist and translator of Castiglione's *Il Cortegiano.* He studied at Cambridge and traveled much in Europe; he was knighted in 1566 and was sent as English ambassador to France. He died in Paris. The *Courtyer of Count Baldessar Castilio* was published in London in 1561, and its popularity is attested by the number of other editions, 1565, 1577, 1588, 1603. Of Hoby, Ascham (*q.v.*) says in the *Scholemaster* (Arber's reprint, p. 66) that he "was many ways well furnished with learning, and very expert in knowledge of divers tongues."

See Castiglione, Baldassare.

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Raleigh, W. *Sir Thomas Hoby's Courtier,* in Tudor Translations. (London, 1900.)

HOCKEY, FIELD. — This is one of the few team games played by men and women. Although its origin goes back to the fourteenth century in France, hockey was developed in England, the home of nearly all modern athletic games. It is the favorite winter sport among English women and is gaining in popularity among men. The game was introduced to girls in American schools and colleges in the autumn of 1901. It was received with so much interest and enthusiasm that it soon won a permanent place in the athletics of schools and colleges for women. Field hockey is a splendid, healthful game; its effect upon the players is to develop vigor, endurance, and mental alertness. It offers to girls essentially the same advantages that boys derive from football, lacrosse, and ice hockey.

The game is played by two teams of eleven players — five forwards, three half backs, two full backs, and a goal keeper. The outfit consists of a hardwood stick which has a blade about a foot long, bent at an angle of forty-five degrees from the handle, which is about two feet long. The ball used is a cricket ball or a solid rubber ball painted white. The game is played on a smooth field a hundred yards in length by not less than fifty yards nor more than sixty yards in breadth. This space must be marked out with whitewash lines and with a flag at each corner. The longer lines are called the " side lines " and the shorter ones the " goal lines." Transverse lines are marked in the centre and midway between the center and the goal lines. Five yards inside each side line is marked a dotted line, parallel with the side line; this is called the " five-yard line." In the middle of each goal line, and four yards apart, are placed the goal posts. These are uprights seven feet high with a cross bar on top and a net forming a pocket behind the posts and crossbar. In the front of each goal line and fifteen yards from it is drawn a line four yards long, parallel to the goal line. The ends of this line are carried round in a curve, forming a quarter circle, until they reach the goal line at a point fifteen yards from the center of the goal. This half circle is called the " striking-circle." G. L. M.

Reference: —

Applebee, Constance M. K. *Field Hockey for Men and Women.* (New York, 1903.)

HOCKEY, ICE. — A strenuous and fascinating game developed in Canada during the last quarter of the nineteenth century. The English game of field hockey and the old game of " Shinty " or " Shinny " contributed the essential principles of the modern game of Ice Hockey. In the United States this game is played by boys and young men in schools and colleges where the climate permits of ice skating during the winter months. It is played on a rink about 80 by 180, or 100 by 200 feet surrounded by a wooden wall about two feet high. At each end is a goal made of two posts four feet high and six feet apart. The game is played by teams of seven players — four forwards, one on each wing and two in the center, a cover-point, a point, and a goal keeper. The players use high, long, and strong skates, and a bent stick made of ash or hickory. The stick has a blade about a foot long and three quarters of an inch thick, bent at an angle of forty-five degrees from the handle, which is three and a half feet long. The game is to push and drive a puck into the goal. The puck is circular, one inch thick, three inches in diameter, and made of vulcanized rubber.

The rules of the game resemble those of American football; the player must be " on side," and the puck must not be passed forward to another player. As played in the United States and Canada, it is a rough and strenuous game. A good hockey player must be a fine skater, and possess strength, agility, pluck, good judgment, and endurance. Hockey is a splendid game to develop physical vigor and manly qualities when properly played, but like basketball, and football it degenerates into a rough and sometimes brutal game when not properly supervised. Students should not be permitted to engage in this sport unless they have been examined by a competent physician, and declared free from disease or organic weakness.

There is a real need for such games as ice hockey, football, and basket ball for the best physical and moral development of healthy boys and young men, but these games require most careful supervision by educational authorities to insure beneficial rather than harmful results. G. L. M.

See Athletics, Educational.

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Farrell, A. *Ice Hockey.* (New York, 1910.)
Patterson, C. E. Hockey, a National Winter Game. *Outing Magazine,* February, 1903.

HOFWYL. — See Fellenberg.

HOGG, QUINTIN (1845–1903). — English social reformer and founder of the Regent Street Polytechnic, was born in London, February 14, 1845, the fourteenth child of Sir James Weir Hogg, Baronet and Privy Councilor. Quintin Hogg was educated at Mr. Lee's preparatory school at Brighton and at Eton (1858–1863), where he showed intellectual promise, was very popular with the boys on account of his athletic distinction and public spirit, and founded in Joynes' boarding house a Sunday Bible Class and prayer meeting which went by the name of the " Synagogue." England was moved at the time by a strong religious revival, and Hogg, most manly of boys, had an unique influence upon the life of his contemporaries at Eton. In 1863 he went into a tea merchant's business in Mincing Lane, in the city of London, and was touched with sympathy for the wastrel boys whom he saw in the streets. Impressed by some experiences with these, he devoted himself zealously to obtaining first-hand acquaintance with their class, and, disguised as a shoeblack, he spent nights with poor boys, frequently sleeping in the open or under arches. The beginning of the Polytechnic may be traced to his efforts to teach reading, with the Bible as a textbook, to two crossing sweepers.

With his friend Arthur (afterwards Lord) Kinnaird, he hired a room in Of Alley (now York Place, Charing Cross) and started a ragged school (*q.v.*). He and his friend held prayer meetings for the Covent Garden porters and classes for the flower girls at Charing Cross. All this time Quintin Hogg was mastering the details of his own business and taking a leading part in the athletic life of Eton and of London. In 1868 he traveled in the West Indies and the United States and formed a strong admiration for the Americans. In 1871 he married the daughter of William Graham, a famous collector of pictures. For nearly thirty-two years Hogg and his wife devoted their leisure and a great part of their fortune to work among young people in London. Their experience in the United States and Canada made them strong advocates of supervised, selected child emigration. In America Hogg met D. L. Moody, whose subsequent work in England he did much to forward. The Ragged School, which had been moved first to Castle Street, W. and then to Long Acre, became the center of a widely extending philanthropic work, Mr. Robert Mitchell acting as secretary from 1872 onwards. Trade classes were organized with the aid of grants from the Science and Art Department, and the combination of educational with religious work was the distinctive feature of Hogg's policy. In 1881 he purchased the buildings of the Polytechnic, an institution famous in its time but then in decrepitude, which had combined instruction and amusement for the young. This was the first of the London Polytechnics (*q.v.*), which are institutions under public management for the provision of instruction, recreation, and social intercourse for young men and women of the wage earning and lower middle class. Hogg lived in Cavendish Square, in a house which adjoined the Polytechnic at the back. In order to make use of the rooms which lay empty in the daytime, a day school was established at the Polytechnic in 1886. The large annual deficit on the working of the Polytechnic was met from Quintin Hogg's private purse.

Hogg's life was given to the fusion of the two ideals of Christian service and educational organization. When his work came to maturity, the Elementary Education Act, 1870, had already provided a stronger, though still imperfect substructure for technical instruction. The religious revival had moved some of the rich to a new sense of public duty. Collectivist thought had diffused an ideal of social unity in civic enterprise. The timeliness of Hogg's work lay in the convergence of these different currents of thought and opportunity.

But educational work on a scale so large as Hogg's could not permanently depend upon private liberality. Its very importance not less than its financial needs necessitated public endowment and representative control. In 1878 a Royal Commission was appointed to inquire into the condition of the parochial charities of the city of London, many of which, though wealthy, had become obsolete in application. In 1883 the City of London Parochial Charities Act was passed and directed the Charity Commissioners to frame new schemes for the application of city charities in such a way as to promote the welfare of the poor of the metropolis by education, free libraries, open spaces, and otherwise. The work of the Polytechnic attracted the attention of the commissioners, and large subsidies were promised from the city parochial funds, including a capital grant of over £11,000 to the Regent Street Polytechnic and a yearly endowment of £3,500, on condition that supplementary resources were obtained from the public. Quintin Hogg now for the first time appealed for subscriptions. The fact was disclosed that his personal expenditure upon the Polytechnic alone had amounted to £100,000. Public opinion was heartily responsive and in the course of a few years ten new Polytechnic institutes, with four branches, were established in London in imitation of the work which Hogg had set going in Regent Street.

Hogg, still immersed in the work of the Polytechnic, died suddenly on January 16, 1903. At the " Poly," as the Polytechnic is known to its members, the memory of " Q. H." will always remain in affectionate remembrance. Hogg's work was one of the causes which, at a critical time, prevented a breach between religious activities and educational developments in England. It now needs to be supplemented (1) by the systematic organization of continuation classes for adolescents, and (2) by an enlargement of the resources of the University of London and its more scientific adjustment to the educational needs of the metropolis. M. E. S.

See BESANT, SIR WALTER; MECHANICS INSTITUTE; POLYTECHNICS, LONDON

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HOLBROOK, ALFRED (1816–1909). — Normal school principal, son of Josiah Holbrook (*q.v.*), was educated in the public schools of Massachusetts and at Groton Academy. He was for several years principal of the Western Reserve Teachers' Seminary, and in 1855 he founded the Southwestern Normal School at Lebanon, Ohio, which ultimately assumed the name of National Normal University. He was president of this institution for fifty years. He wrote *Methods of Teaching, School Management,* and an English grammar. W. S. M.

HOLBROOK, JOSIAH (1788–1854). — Founder of the Lyceum movement (*q.v.*) in the United States and organizer of one of the earliest industrial schools, was educated in the district schools at Derby, Conn., and graduated at Yale College in 1810. He organized an industrial school at Derby in 1819, after the pattern of Fellenberg's institution at Hofwyl; and in 1824 he established an Agricultural Seminary at Derby, in which, besides the customary secondary school studies, surveying and practical agriculture were taught. (See AGRICULTURAL EDUCATION.) His most important service to education, however, was the development of the lyceum movement which resulted in the organization of lecture courses, the establishment of libraries, and the equipment of schools with scientific appliances in hundreds of towns in the country. (See AMERICAN LYCEUM ASSOCIATION.) In 1826 he opened an educational exchange in Boston for the manufacture and sale of school apparatus. In 1830 he began the publication of a series of *Scientific Tracts* for the use of teachers and advanced students. In the next year he was active in the organization of the American School Society (*q.v.*). In 1832 he founded *The Family Lyceum,* a weekly paper for the diffusion of useful knowledge. He lectured widely before lyceum associations on scientific subjects, and was a frequent lecturer at teachers' institutes conducted by Horace Mann in Massachusetts and Henry Barnard in Connecticut. He was also active in the American Institute of Instruction (*q.v.*) and the various educational associations in New England, New York, and Pennsylvania.

W. S. M.

See AMERICAN LYCEUM ASSOCIATION: LYCEUMS.

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BARNARD, H. *American Journal of Education.* 1860. Vol. VIII, pp. 229–256.

HOLIDAYS, SCHOOL. — In the United States the public schools in cities usually begin in September and continue until May or June. The common term in the North Atlantic and North Central groups of states is from 180 to 200 days in the cities, 140 to 160 days in the village or town, and 100 to 140 days in the rural schools. The shorter the term, the longer the summer vacation. Nearly all town schools begin by October, the term being shortened at the end. During the regular school year certain holidays are commonly granted, the most common and universal of which are every Saturday and Sunday in full; Thanksgiving Day, on the last Thursday in November, and commonly the Friday following it; from ten days to two weeks covering Christmas and New Year's; and from one or two days to a week at, or near, Easter. Other general holidays frequently observed as school holidays are election day, coming early in November in alternate years; Washington's birthday on February 22; and Memorial Day on May 30. Admission Day is observed as a holiday in some states; Columbus Day (October 14) is being declared a school holiday in many states; and Lincoln's birthday (February 12) is also frequently observed in the Northern and Western states in whole or in part as a holiday.

On the continent of Europe Saturday is seldom a whole holiday. In Germany schools are commonly in session six mornings a week, with from two to four afternoons in addition. Wednesday and Saturday afternoons are commonly half holidays. About ten weeks of vacation are allowed each year in German schools, in addition to certain church festivals. In Prussia and most of the northern states two weeks are given at Easter; about one week at Whitsuntide; four weeks in the summer, mostly in July; two weeks at Michaelmas; and two weeks at Christmas. Bavaria, where the summers are warmer, has no vacation at Whitsuntide and only one week at Christmas, but about eight weeks in summer. The church festivals of Epiphany, Candlemas, Annunciation, Corpus Christi, *Peter-Paulstag,* All Saints, and Conception of the Virgin are observed in Catholic countries; the *Reformationsfest* in German Protestant schools; and the birthdays of the reigning sovereigns commonly in all monarchical countries. Not to be omitted are the holidays given when the thermometer registers twenty-five degrees Celsius at ten o'clock A.M. (*Hitzefreiheit*), at the discretion of the school principal or the local school inspector (*Ortsschulinspektor*). In France the week-holiday is on Thursday, Saturday being a full school day. The summer vacation is of about two months' duration, with short vacations at New Year's and Easter, and on certain religious and national holidays.

In England the common practice in elementary schools is to give about two months of vacation throughout the year, usually divided as follows: three to four weeks in summer, two weeks at Christmas, one week at Easter, and one week at Whitsuntide. Special holidays are unusual, although a movement is on foot to introduce the general observance of Empire Day in schools. In the secondary schools twelve to fifteen weeks in each year are given up to vacations, of which six or seven weeks are taken in summer, three or four weeks at Christmas, one to three weeks at Easter, and in some cases, especially in the North, one to two weeks at Whitsuntide. In addition most schools recognize a mid-term holiday of one or two days, and one or two half holidays in each week or a whole holiday on Saturdays. Special holidays are observed on Founder's Days in the older schools, and occasional half or whole holidays are given to celebrate any distinctions won by a school either in scholarship, athletics, or the more solid distinctions of later life.

See SESSION, LENGTH OF. E. P. C.

HOLIDAYS, SPECIAL. — See SCHOOL TERM, LENGTH OF; SPECIAL DAYS; also EXCURSIONS, SCHOOL; FESTIVALS, SCHOOL.

HOLLAND. — See NETHERLANDS, EDUCATION IN THE.

HOLLAND, PHILEMON (1552–1637). — An English schoolmaster and translator, who practiced medicine for some time before he became usher in Coventry Free School in 1608, and then headmaster (1627–1628). He played an important part in the civil life of Coventry, and was given the freedom of the city in 1612. The "translator Generall in his Age" (as Fuller calls him) was familiar with Latin, Greek, Italian, and French, and had a good command of the euphuistic style in English which was then popular. His translations were somewhat free, since he worked on the theory that "each nation hath severall manners, yea, and terms appropriate by themselves." He translated so many books, according to Fuller, "as will make a country gentleman a competent library for historians." These translations included Livy (1600), dedicated to Queen Elizabeth; Pliny's *Natural History* (1601); Plutarch's *Morals* (1603); dedicated to James I; Suetonius' *Twelve Cæsars* (1606); Camden's *Britannia* (1610); and Xenophon's *Cyropædia* (1632).

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HOLLOWAY COLLEGE ROYAL. — See WOMEN, EDUCATION OF; LONDON, UNIVERSITY OF.

HOLMES, GEORGE FREDERICK (1820–1897). — College president and textbook author; was educated at Durham University, England, and came to America in 1838. He taught in secondary schools in Virginia and Georgia; was professor in Richmond College (1845–1848), first president of the University of Mississippi (1848–1849); professor in William and Mary College (1849–1857) and the University of Virginia (1857–1897). He was author of an extended series of textbooks widely used in the South, and of several historical works. W. S. M.

HOLMGREN TEST. — A method of testing the ability to discriminate between colors. A large number of differently colored worsted skeins, thoroughly intermixed, is shown the subject to be investigated. The experimenter selects one of these, and, giving it to the subject without naming its color, asks him to pick out from the others, one by one, all worsteds of similar coloring. The normal subject does this rapidly and without error. The subject with defective color vision will, however, if the color given him to match falls within his defect, show such hesitancy in selecting and such uncertainty in his matches that the experimenter may, on this account alone, well be suspicious. But in addition to the uncertainty, he will make positively wrong choices. There are two main tests, — the green test and the red test. For the first a bright, low-saturated green, neither yellowish nor bluish, is given as the test color. The red-green color-blind person will then chiefly choose, as similar colors, the grays, the browns, and the slightly reddish, yellowish, and bluish hues. For the red test an unsaturated red is chosen as the test color. The errors will include worsteds tinged with violet, and greenish and brownish hues. Sometimes one of these tests will suffice; sometimes both are needed. In one or the other, however, both types of the red-green color-blind will with fair certainty betray themselves, as well as those commonly termed "color-weak." The yellow-blue color-blind will choose a bluish red as similar to a yellowish red or a bluish green as similar to a yellow-green. It has been found, however, that many of the "color-weak," and even of the color-blind, may, especially with practice, successfully pass the Holmgren test; in cases of doubt, therefore, one of the more exact tests should be given. R. P. A.

See EYE; NAGEL'S TEST.

HOLT, JOHN. — The writer of a very early Latin grammar, the *Lac Puerorum, or Mylke for Children.* Holt was master of the school attached to Magdalen College, Oxford, a school renowned for its teachers of grammar, including such men as Anwykyll, Stanbridge, Robertson, and Cooper. Dr. J. H. Lupton (*Life of Colet*, p. 24) thinks that the earliest undated edition of Holt's book was published between 1486 and 1496. The earliest dated edition appears to be 1497, thirty years before Colet's *Æditio* (1527), which was the basis of Lily's *Grammar.* The simplicity of Holt's grammar is remarkable, being written in the easiest English, clearly with a view to helping children. The earliest printed Latin grammars were in English; the use of Latin in the textbooks was established by Lily and the later grammarians and was a constant cause of disagreement amongst English teachers. Holt begins with the names of parts of speech, and proceeds to the declension of the article. With the aid of woodcuts representing a hand or similar device, he illustrates the different cases or declensions by labeling different parts with the appropriate names. In a businesslike, sensible and concise way Holt goes through the whole of the accidence. Thus in dealing with the moods of the verbs, he calls them the showing mood or indicative; the bidding mood or imperative; the willing mood or optative; leaving the infinitive undescribed. Then he proceeds to the simple statement of the concords, the ablative absolute, construction of verbs with diverse cases, and other important constructions, all being arranged so as to give the pupil the most important as well as the shortest teaching. The book ends with epigrammatic verses of Sir Thomas More in praise of Holt's book. F. W.

See GRAMMAR, ENGLISH.

HOLY CROSS COLLEGE, NEW ORLEANS, LA. — A school for boys conducted by members of the Congregation of the Holy Cross, established in 1879. Commercial and classical courses are offered.

HOLY CROSS COLLEGE, WORCESTER, MASS. — See JESUS, SOCIETY OF, EDUCATIONAL WORK OF.

HOLYBAND or HOLLIBAND, CLAUDE (pseudonym of Claude de Sainliens or A Sancto Vinculo). — French Huguenot refugee in England; came to England in the second half of the sixteenth century, at any rate by 1566, and remained there till 1597. He played an important part in the development of French studies in England. In 1566 Holyband published his *French Littleton.* This was intended to appeal specially to lawyers and students of the Inns of Court, and was published by Holyband's Huguenot compatriot, Vautrollier. In 1573 an edition of Holyband's *French Schoolmaster* was published (the first edition, of which no copy is known, is said to have been issued in 1565). This contains dialogues on such subjects as Getting up in the morning, Two neighbours meeting, Welcoming any one to a house, To ask the way, To ask for a lodging, To go to bed, To buy and sell. Then follow: Proverbs, Creed, Ten Commandments, Graces, etc. In 1580 Holyband wrote his *Treatise for declining of* (*French*) *Verbes* and his *de Pronunciatione Linguæ gallicæ* (in Latin) in the same year. In this year (1580) also, he published *The Treasurie of the French Tong: teaching the waye to varie all sortes of Verbes; enriched so plentifully with Wordes and Phrases.*

In 1593 the *Treasurie* was developed into *A Dictionarie, French and English.* This was the most important French dictionary which had appeared, and Miss Lucy E. Farrer has shown that a copy was by 1608 augmented by Randle Cotgrave (*q.v.*) and in 1610 handed over to Islip the printer, who issued the complete work as Cotgrave's *French-English Dictionary* in 1611. Holyband thus deserves a high place in the history of French studies in England, and is an interesting example of the close connection of the immigration of religious exiles with the teaching of their native language in the country of their adoption, partly of course because schoolmasters often took an important part in the religious controversies of their time in their own country, and when exiled continued their old avocation of teaching for a living. F. W.

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HOLYOKE, EDWARD (1689-1769). — Eleventh president of Harvard College; was graduated at Harvard in 1705. He was librarian at Harvard from 1709 to 1712, and tutor from 1712 to 1716. He was president from 1737 to 1769. "At the head of the university he possessed a dignity peculiar to himself. His majestic appearance, his speech and demeanor, were calculated to impress with awe; but notwithstanding his air of dignity and authority, he was humble in heart." W. S. M.

See HARVARD UNIVERSITY.

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HOME AND COLONIAL SCHOOL SOCIETY. — This society was founded by John Stuckey Reynolds (1791-1874), a retired civil servant, in 1836, though in the course of a few years his original plans were several times modified. (1) The first title, "The Home and Colonial Infant School Society," corresponded with the first purpose, the training of infants' teachers. A widening of the purpose was indicated in 1845, when the words "and juvenile" were added after "infant," but the new title proved too cumbrous for daily use, and it was in 1848 reduced to its final form, "The Home and Colonial School Society." (2) At the outset the students were not required to belong to any particular denomination if they held "the fundamental truths of the Bible" and were "of decided piety," though the committee in their first report seem to regret the preponderance of Dissenters among the students. In 1841 the object of the society was (as it still is) stated to be "the improvement and extension of education on Christian principles, as such principles are set forth and embodied in the articles of the Church of England." In 1846 critics were informed that the committee "some years ago deemed it expedient to provide" separate houses for Church and Dissent, that these houses were "at a moderate distance from each other," and that the students met "only during school hours and for lessons." The critics, however, were not silenced, and in 1848 a rule (now the thirteenth of the society's "Laws") was passed, prescribing that "all individuals appointed to reside" in the college should sign a declaration of conformity with the Church. (3) As Reynolds accepted Wilderspin's theory that an infant school ought to have both a master and a mistress, married couples were specially invited to become students. At first the invitation was readily accepted, but in 1847 the committee reported that the supply had diminished and that "these circumstances" had "necessarily led to the training and employment of females almost exclusively." (If they had waited a year or two, they could have omitted the "almost.") (4) The first home of the society was in Southampton Street, Holborn, London; but after two years the college was removed to Gray's Inn Road, where, with repeated enlargements of its borders, it remained till 1903.

The Rev. Charles Mayo (*q.v.*), one of the earliest English disciples of Pestalozzi, was an original member of the committee, and through his influence the principles of the Swiss reformer were included in the curriculum. He died in 1846, but the good work was continued by his sister, who wrote several textbooks and for many years supervised the professional training. The *Seventy-Fifth Annual Report* of the Society says that "the principles of Pestalozzianism which it strove to inculcate and extend have long since incorporated themselves in some form or other into every department of the training of the young, and are therefore no longer so distinctive as they were, say, fifty years ago."

When in 1846 state grants were offered to Training Colleges, the committee resolved to accept them. As some of the students had, almost from the beginning, been prepared for teaching in nurseries or in private schools, the operations of the society were divided into two departments (still subsisting), a "government department" and a "non-government department." The premises in the Gray's Inn Road, being only adapted houses, could never have reached a high standard of comfort or convenience; and as the standard rose faster than improvements could be made, the Committee determined to migrate to the suburbs. Large and imposing buildings surrounded by fourteen acres of fine grounds were bought at Wood Green, where in 1903 the college entered on a fresh career of usefulness and prosperity.

D. S–n.

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HOME AND THE SCHOOL. — See FAMILY EDUCATION; PARENTS AND THE SCHOOL.

HOME EDUCATION. — See FAMILY EDUCATION.

HOME EDUCATION, INTERNATIONAL CONGRESS OF. — See INTERNATIONAL CONGRESSES OF EDUCATION.

HOME GEOGRAPHY. — See GEOGRAPHY.

HOME STUDY, HYGIENE OF. — An important function of school instruction is to develop interests that will determine and guide the pupil's activity outside of the school. For the attainment of this end home study is an important means. While hygienists strongly condemn excessive home work and the evils of worry and anxiety often connected with it, the desirability of a certain amount of home study, especially in the higher grades, is now generally recognized. With home study it is, of course, necessary that the home conditions should be hygienic. The wholesome habits developed in the school should not be broken by unhygienic work at home. Pupils should sit in correct posture and hold the book at a proper distance from the eyes; they should work for rational periods of time; they should breathe pure air, not overheated or too dry. All the commonplace but important rules of hygiene for intellectual work should be observed.

For many years there has been great conflict of opinion among educators in regard to the kind and amount of home study that is desirable. Recently special investigations have been made by Schmidt and Mayer, which bring out certain factors that are likely to be overlooked. It appears that in our large cities frequently there is really no home, because a whole family may be crowded into one or two basement rooms, an attic, or the like, and suitable conditions for home work are out of the question. Again it is shown that in most subjects children working in a group of other children do more and better work than in the relative isolation of the home. Certain kinds of work, however, seem to be done better in the home when the conditions are hygienic, especially work requiring independent thinking, like composition in the mother tongue, for example. Schmidt's studies show apparently that the ordinary disturbances in the home from the presence of the other members of the family, the noise of domestic work, and the like, do not serve as distracting stimuli for ordinary children. And thus it would appear that for some kinds of work in a moderate amount there are distinct advantages in home study; but that for most of the school work, especially the more mechanical part, the conditions are more favorable in the schoolroom.

The practice of students in regard to home study differs greatly in different countries and in different grades of the school, and individual variations are likely to be very great, some children studying none at all, others perhaps several hours a day. There is grave danger that the best students will overwork. Kemsies, Griesbach, and Roller in Germany and Patzak in Austria found some students in the higher classes of the secondary schools who spent four or five hours daily in home study. The regulations and customs in different countries in this matter also differ greatly. There is probably, however, a consensus of hygienists that home work should be limited and in regard to the points included in the school regulation at the city of Zürich. For the secondary schools it reads as follows: "The home work must be thoroughly prepared for by the instruction. The repeated copying of the same task as a punishment is inappropriate. From the forenoon to the afternoon of the same day no tasks may be given. For Sundays and holidays, as well as the vacations, no more tasks are to be given than from one day to another. Where several teachers give instruction in the same class, there should be an understanding in regard to the number and extent, and a proper division, of the home tasks." W. H. B.

See SCHOOL MANAGEMENT.

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HOMER. — The name Homer means to us the *Iliad* and the *Odyssey,* the two Greek epics with which occidental literature begins. It is generally agreed that these earliest poems of Europe are also the greatest. A fact so striking, while it raises questions that cannot be answered, itself goes far to justify the place which Greek has held in occidental education, if literature should have in education any considerable place. These epics are also a poetic picture (not a scientific description) of a historical period, an early stage in the development of European society. In this sense they may be called the beginning of European written history, though they are fiction. Archæological finds, as idols, utensils, artistic handiwork, lordly dwellings, also throw light on the life of which they are the product, and are a parallel to Homer on this side, at some points perhaps of more scientific value; but for most people these fragments have less interest than the poet's whole.

Such highly wrought compositions, of nearly 15,000 and 12,000 lines respectively, must have had predecessors, though none survive. First, the meter is not that of rude beginnings. The dactylic hexameter is bound by strict laws, yet is flexible and expressive, and is employed with a mastery that speaks of long practice; it was probably formed long before Homer, by the slow welding of two more primitive short verses. The language also is not the unmixed speech of one region and a single period; it is a literary dialect, as truly as the language of Tennyson, combining for artistic use forms and phrases that in living speech had belonged to distant localities and distinct generations and that bear the marks of long poetic tradition. Again, into the tale itself are skillfully woven some elements that are shown to have originated, and been highly elaborated in verse, in widely separated parts of Hellas. Finally, there are allusions in the poems to earlier heroic lays, tales of famous deeds, and to songs of labor and of festival, and of mourning. Far from being themselves primitive, the two poems are the culmination of a long development, the product of an age of high poetic culture and informed with the distinctive qualities of the greatest Hellenic art, however undeveloped the people may have been in other respects. The date of the poems is unknown; by inference and conjecture it may be placed about 1000 to 800 B.C.

The *Iliad* is probably slightly the earlier. The title *Iliad* seems at first inappropriate; only a small part of the war against Ilios, another name for Troy, is included. Yet around the account of the wrath of Achilles and its consequences the poet groups a sufficient account of the origin and of typical incidents of the war to represent well the nature and spirit of the whole. The name is after all not an artistic fault. The subject of the *Odyssey* is the return of Odysseus after the fall of Troy.

The two poems together present a wide range of human life under forms both simple and typical, so elemental that they are in essence true for all ages. And this is done with dignity, with a purity of taste that rarely errs, with a rapid movement that is never hurried, with a charm that holds the reader as it held the ancient listener of every class. In Greek education, from the earliest of which we know anything, the *Iliad* and *Odyssey* were the schoolbooks most widely used. The language was almost as antique by the fifth century B.C. as that of Chaucer to us; it therefore gave the Greek boy a little of the philological training that comes with the study of a foreign tongue, and was at the same time the basis of all later poetic language, so far as that differed — and it always differs — from daily speech. The substance also of the poems entered into all later Greek literature.

Were these masterpieces the work of one master, Homer, or of two, or of a group or school of popular poets? How did the *Iliad* and *Odyssey* come into being? That is the *Homeric question.* The two poems have about as much likeness and difference as two novels of Scott or of Thackeray have. If one supreme poet of that age is a marvel, still more are two. And yet more marvelous would be a whole school of poets, of more than one generation, all working in the same spirit, all anonymous, who should by any kind of joint activity, contemporaneous or successive, produce two such extraordinary works of genius. Yet it is true that each poem, while essentially a unit, contains incongruities not easy to explain. We must certainly admit later additions and interpolations, of considerable extent in the *Iliad,* less in the *Odyssey.* After more than a century of active investigation and vigorous discussion, beginning with the *Prolegomena* of Wolf (1795), scholars are tending toward definite acceptance of one poet, wholly unknown except in the poems, with moderate additions and changes by successors and imitators, through whom, mainly by public recitation, the poems were transmitted for several centuries, until written copies became common. The references below will indicate where full discussion may be found.

In modern schools since the Renaissance Homer has been more read than any other classic Greek author, both because of his importance in the development of European letters and because his peculiar charm is of a sort that attracts young people as well as their teachers. At present Homer is taken up after a very moderate amount of reading in Attic prose; he is continued more or less alongside of other authors in *Gymnasium*, *lycée*, and college; the difficulties of interpretation and the Homeric question are a large topic in university study. Herbart and a very few teachers have maintained that Greek study should begin with Homer, on pedagogical grounds. Evidently that is an error. Would any one maintain that German boys should begin English with Chaucer, or that we should begin German with the *Nibelungenlied?* Homer should rather be postponed till more of Attic Greek has been read; both *Iliad* and *Odyssey* might then be read rapidly and nearly entire. Thus they would make more nearly their proper impression, and give far more pleasure. On the linguistic side at this first reading the comparison with Attic forms, diction, and syntax should aim at full understanding of the poet's meaning, and little more. And the rhythm, a most important element in the poetic form, is commonly quite missed. It is in even, or two-four, time, while English and German imitations, like Longfellow's *Evangeline*, are in triple time. The simplest way to acquire the true movement is to recite a few lines while walking; this leads one naturally to make the two halves of each foot equal, as they should be. For the English lines that is a villainous distortion; for the Greek the true rhythm is far more melodious and expressive. The titles below merely suggest a good line of approach to the works on Homer — a library in themselves.
T. D. G.

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HOMERIC EDUCATION. — See Greece, Education in Ancient.

HOMES AND REFUGES FOR CHILDREN. — See Orphans, Education of.

HONDURAS, EDUCATION IN. — Honduras has an area of 46,000 square miles with a population, in 1905, of 500,000, or less than eleven inhabitants to a square mile. The vast body of the people are Indians, and of these it is estimated that 90,000 are uncivilized. The republic is governed under a charter proclaimed in 1894 which provides for the election of a president by popular vote for a term of four years and a congress, the members of which are also elected by popular vote, in the ratio of one to every 10,000 inhabitants. The administration of public affairs is intrusted to a council of six ministers, one of whom has general charge of public instruction. The constitution provides for a system of free, secular primary schools, with compulsory attendance for children seven to fifteen years of age; but by reason of the sparseness of the population, and its racial character, as well as the political upheavals of the country, little advance has been made in the general diffusion of education. The latest official statistics (1909) give the number of primary schools as 660, with about 32,000 pupils; an average attendance is maintained of 75 per cent. For primary education the government expends about $140,000 (silver) annually.

At the chief town of each of the sixteen departments of the republic there is a school for secondary education (*colegio*) with normal school attached. The government subsidizes these departmental schools and also maintains a Central Institute (secondary) at the capital, Tegucigalpa. Recent efforts have been made to raise the standard of training for teachers and to induce young people to engage in the service by increasing the appropriations for salaries.

For the higher grades of education the following establishments are maintained: At Tegucigalpa, the Central University, with departments of law, medicine, literature, and science. In connection with the university there is a free public library, founded by President Soto in 1880; the College for Women, with courses in modern languages, music, domestic economy, physiology, and hygiene; the National Scientific and Literary Institute; a manual training school for mechanic and decorative arts. There is also a theological seminary and parochial school attached, which is supported by and under the control of the Roman Catholic Church. The National School of Medicine has recently been put upon a firm financial basis, and it is hoped that it may soon recover its former prestige. About 25,000 pesos are annually spent to support students of engineering and other practical professions in the United States, Mexico, and Europe. The increasing demand for engineers has led to preliminary measures looking to provision for their professional training either by the reëstablishment of the department of engineering, which was formerly included in the university, or by the organization of an independent school of engineering.

Honduras, British. — A crown colony comprising an area of 7562 square miles bordering on the Caribbean Sea. The population numbers about 41,000. The chief town is Belize, with population between 9000 and 10,000. There are forty-one public primary schools in the colony, maintained almost entirely by government grants, which amounted in 1909 to 3714 ($18,000). The enrollment in these schools was 4447, and the average attendance 3187, or 83 per cent of the enrollment. There are also five private primary schools, of which two have secondary departments, and three private secondary schools. Belize is a center for the local examinations maintained by Cambridge University. A. T. S.

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HONOR SCHOOLS. — Examinations and courses for degrees in the English universities are divided into two classes; — the pass or ordinary, and the honor school. The requirements for the pass degree are less extensive, and demand less specialized study than those for the degrees in the honor schools. Generally the studies for pass degrees are arranged either in groups or are partly prescribed and partly elective. The studies in the honor schools are narrowly specialized, and demand intensive study in one or two allied fields. The following are the honor schools at Oxford: *literæ humaniores*, mathematics, natural science, jurisprudence, modern history, theology, oriental studies, English language and literature, modern European languages. At Cambridge the honor schools are known as Triposes and include: classical, economics, historical, law, mathematical, mechanical sciences, natural sciences, moral sciences, medieval and modern languages, oriental languages, and theological. At the Manchester University, to take a modern institution, the honor schools are classics, history, English language and literature, modern languages and literature, philosophy, architecture, economic and political sciences, oriental studies, Celtic studies. The organization of honor courses in the colleges of the United States is very recent. These are discussed in the article on COLLEGE, AMERICAN. The Canadian institutions follow more generally the English custom.

See UNIVERSITIES; CAMBRIDGE UNIVERSITY; OXFORD UNIVERSITY, etc.

HONORARY DEGREES. — See DEGREES.

HOODS. — See ACADEMIC COSTUME.

HOOLE, CHARLES (1610–1667). — The most important writer on contemporary school practice of the seventeenth century; educated at Wakefield Free School, and graduated from Lincoln College, Oxford (M.A. 1636). He was master of the Rotherham Free School, and afterwards Rector of Great Ponton, Lincolnshire. In 1642, at the outbreak of the Civil War, he went to London and, as Anthony à Wood says, " by the invitation of certain noted citizens he taught a private school there, between Goldsmith's alley in Redcross Street and Maidenhead-Court in Aldersgate Street. By 1651 he had removed his private grammar school to Tokenhouse Garden in Lothbury, not far from the Royal Exchange; where, as in the former school, the generality of the youth were instructed to a miracle." He became later Rector of Stock near Chelmsford in Essex, " where he mostly spent the remainder of his days with great content to himself and his parishioners." Finally, Wood summarizes him as "a noted royalist and therefore suffered for it in the beginning of the wars, was a good Latinist, Grecian and Hebrician and admirably skilled in classical learning."

Hoole's chief book is entitled: *A New Discovery* [=Description or Disclosing] *of the old Art of Teaching Schools, In four small Treatises, concerning* 1 *A Petty Schoole,* 2 *The Ushers Duty,* 3 *The Masters Method,* 4 *Scholastick Discipline — in a Grammar School. Shewing how Children in their playing years may Grammatically attain to a firm groundedness in and exercise of the Latine, Greek and Hebrew Tongues. Written about Twenty-three years ago, for the Benefit of Rotherham School, where it was first used; and after fourteen years trial by diligent practise in London in many particulars enlarged, and now at last published for the general profit, especially of young Schoole-Masters, etc.* 1660.

At the end of the "Address to All favourers of good learning" Hoole gives a "Note of School Authors most proper for every Form of Scholars in a Grammar School." In one row he places classical authors to be read, and in a parallel row subsidiary authors to be consulted. This he does for each of the forms into which he divides a school. Hoole, in the course of his work, gives the names of between 250 and 300 authors and writers of textbooks allotted out amongst the different forms of the school, and the *New Discovery* is therefore a most important storehouse of school bibliography.

In the *Petty School,* Hoole shows how children should be taught "with delight and profit," pronunciation, spelling, reading. The *Usher's Duty* is chiefly connected with the perfecting of English reading and teaching Lily's Grammar. The *Master's Method* deals with the training of scholars in Grammar, Authors, and Exercises; Greek, Latin, and Hebrew. The *Petty School* is a preliminary school; the usher deals with Forms I, II, III and the Master's work begins in Form IV.

Hoole deserves credit for laying emphasis on the earliest teaching of the child. He says: "The Petty [*i.e.* French *petit*] school is the place where indeed the first principles of all religion and learning ought to be taught, and therefore rather deserveth that more encouragement should be given to the teachers of it than that it should be left as a work for poor women or others, whose necessities compel them to undertake it as a mere shelter from beggary." Hence he appeals for the appointment of well qualified teachers for the Petty School, and the endowment of such posts with adequate funds, especially praising Bathurst and Gouge for their efforts in this direction. He considers forty children as many as any one teacher ought to have in one class. In the section entitled *Scholastic Discipline* Hoole deals with the Founding of a Grammar School, and appeals for provision of further schools and masters.

Besides the *New Discovery,* Hoole wrote: (1) *An Easie Entrance to the Latine Tongue.* 1649. (2) *Terminationes et Exempla Declinationum et Conjugationum.* 1650 and 1659. (3) *Propria Quae Maribus, Quae Genus and As in Praesenti, Englished and Explained.* 1650. (4) *The Latine Grammar Fitted for the Use of Schools.* 1651. (317 pp.) (5) Ἡ ΚΑΙΝΉ ΔΙΑΘΗΚΗ. *Novum Testamentum. Huic editioni omnia difficiliorum Vocabulorum Themata, quae in Georgii Pasoris Lexicon Grammatice resolvuntur, in margine apposuit Carolus Hoole. In eorum scilicet gratiam, qui prima Graecae Linguae tyrocinia faciunt.* 1653. (6) A translation of *Maturinus Corderius's School-Colloquies.* 1657. (7) *Vocabularium Parvum Anglo-Latinum, In usum Puerulorum, qui prima Latinae Linguae Tyrocinia faciunt.* 1657. (8) *Sentences for children, English and Latin from Leonard Culman.* 1658. (9) A translation of Comenius' *Orbis Sensualium Pictus.* 1659. (10) A translation of *Catonis disticha de Moribus, Dicta insignia Septem Sapientum Graeciae, Mimi Publiani, sive Senecae Proverbia, Anglo-Latina.* 1659. (This contains a valuable Preface by Hoole on his Methods.) (11) *Children's Talke, English and Latine.* 1659. (12) *The Common Rudiments of Latine Grammar Usually Taught in all Schools.* 1659. (166 pp. including Index.) (13) *Examinatio Grammaticae Latinae in usum Scholarum adornatae.* 1660. (14) *A Century of Epistles English and Latine; selected out of the most used School-Authors — viz. Tullie, Plinie, and Textor. By imitating of which children may readily get a proper style for writing letters.* 1660. (15) *P. Terentii Comoedia Sex Anglo-Latinae.* Edited by Hoole, 1663. (16) *Aesop's Fables English and Latin.* 1700. F. W.

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HOPE COLLEGE, HOLLAND, MICH. — Founded in 1851 as Pioneer School, reorganized as Holland Academy in 1857, and incorporated as Hope College in 1866, this institution is coeducational and is under the auspices of the Reformed Church in America. In addition to the college a preparatory school and a school of music are maintained. The requirements for entrance are about fifteen units. The college courses are arranged in classical, philosophical, modern language, and natural science groups, and all lead to the A.B. degree. There are twenty members on the instructing staff. The total enrollment in 1910–11 was 388.

HOPKINS BEQUEST AND THE HOPKINS GRAMMAR SCHOOL. — The fund was established by the will of Edward Hopkins, a London merchant who emigrated to Hartford in 1638, and was many times governor of Connecticut. Subsequently returning, however, to England, he died there in 1658. After making other bequests, he left the residue of his New England estate — besides £500 to be delivered upon the death of his widow — "to give some encouragement in those foreign plantations for the breeding up of hopeful youths in a way of learning, both at the grammar school and college"; two residents of each Connecticut colony were named to execute the trust. After some hindrance the trustees in 1664 gave £400 for the grammar school at Hartford, and agreed to divide the remainder equally between the grammar schools at New Haven and Hadley, Mass., the latter being obligated, however, to give to Harvard College the sum of £100. Eventually, New Haven received £412 and Hadley £308. When the widow died in 1699, none of the original trustees surviving, their successors applied for the £500 bequest, but were told that the estate did not suffice to pay it. In the hesitation to enter upon a doubtful suit at law in a distant court, nothing was done. In 1708 the Society for the Propagation of the Gospel (*q.v.*), learning of the failure of the bequest, moved in Chancery that it be assigned to the Society. Whereupon friends of Harvard College moved vigorously in the matter and recovered nearly £800, principal and interest, of which sum the master in Chancery awarded three fourths to Harvard and one fourth to the Cambridge Grammar School. It does not now appear how this direction of the fund was justified.

The bequest so apportioned has been used in the main as directed. New Haven has utilized her portion most successfully. The Hopkins Grammar School, organized in 1668, has maintained an unbroken succession under the original trust, and has proved a most important preparatory school to Yale almost from the foundation of the latter. Hadley, Hartford, and Cambridge have not maintained separate foundations. The first of these has merged its remaining colonial grants and donations in the town high school; the two latter maintain from similar funds classical masters in their respective high schools. At Cambridge he is called the Hopkins classical master.

W. H. K.

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HOPKINS, MARK (1802–1887). — Fourth president of Williams College, born at Stockbridge, Mass., Feb. 4, 1802. He was instructed by private tutors and at the Clinton Academy, and was graduated from Williams College in 1824. Five years later he completed the course of instruction at the Berkshire Medical School. He was for several years instructor in private schools at Stockbridge and Richmond. For six years (1830 to 1836) he was a professor, and for thirty-six years he was president of Williams College. Under his presidency the course of instruction was broadened and the system of discipline modified. Physiology and other sciences were added to the course, and he developed the theory that "the college that is best is that in which there is the least government." He made the personal influence of the teaching staff the chief factor in the government of the college. He was active in promoting the cause of education in mission fields, and gave three courses of lectures on moral science before the Lowell Institute (1844, 1860, 1861). In addition to his numerous sermons and addresses on education, he published *Lectures on Moral Science* (1862), *Christian Ethics* (1869), *An Outline Study of Man* (1873), and *Teachings and Counsels* (1884). He died at Williamstown, Mass., on June 17, 1887, having continued his connection with the college as lecturer on mental and moral philosophy after he resigned the presidency.

W. S. M.

For portrait, see p. 219.
See Williams College.

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HORMAN, WILLIAM (*d.* 1535). — English schoolmaster, born at Salisbury and educated at Winchester He may have studied at Cambridge, and was fellow of New College, Oxford, when he became master at Eton in 1487; in 1494 he became master of Winchester until 1502, when he became fellow and later vice-provost of Eton. Horman was the author of many works in the fields of history, theology, and grammar. His best known work was the *Vulgaria*, published by Pynson in 1519, a collection of sentences in English and Latin arranged according to subjects, *e.g.*, *de pietate, de impietate, de exercitamentis et ludis*, etc. The work presents an interesting picture of school life as seen by one who knew the two best schools of his day intimately. In the *Antibossicon* (1521) Horman came to the defense of his friend, William Lily (*q.v.*), whose method of teaching Latin had been attacked by Robert Whyttington.

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HORNBOOK. — A device for teaching the alphabet and the first reading lessons to beginners. It consisted of a flat board with a handle, and on this was pasted a sheet of paper containing the letters of the alphabet, the vowels, combinations of vowels and consonants (*ab, eb, ib,* etc.), the Benediction (In the Name of the Father, and of the Son, and of the Holy Ghost. *Amen*), the Lord's Prayer, and sometimes the Roman numerals. Over this was placed a thin sheet of transparent horn, which gives the name to the device, held down by narrow strips of some thin metal and nails. The handles were generally pierced with a hole by which the hornbook was fastened on the girdles or round the necks of the scholars. The backs of the hornbooks, such as were used in noble families, were sometimes covered with leather embossed with a picture of St. George and the Dragon, or Charles I mounted on a horse, or with silver or gold filigree work. When the hornbooks came into use cannot now be traced, but they were certainly known at the beginning of the sixteenth century. In a manuscript of Sacrobosco, *c.* 1442, a teacher is represented holding in his hand a board shaped like the hornbook, on which the Roman numerals up to nine are written (see Smith, *Rara Arithmetica,* Boston, 1908). The hornbook, containing only the alphabet, appears in an illustration in Reisch's *Margarita Philosophica,* issued in 1503. By the end of the sixteenth century the use of the hornbook is referred to as a common practice in English literature. And so it continued to be to the end of the eighteenth century, for in 1799 a large English dealer in hornbooks found that orders for them came to a stop. In America the use of the hornbook was as widespread as in England, and declined at about the same time, the end of the eighteenth century. The hornbook of the English and American type is not found in Europe, although similar shaped alphabet boards without the horn were used, as *e.g.* in Holland (AB *boordje*), Germany (ABC *Tabella*), France (*tablette, carte, La Croix de par Dieu*), Italy (*un abbici, centuruola*).

Since the letters of the alphabet in hornbooks and primers were sometimes preceded by a cross, the first line and frequently the whole alphabet was called criss-cross (Christ's cross) row. It is known that the hornbook was sometimes made in the shape of a cross, although examples are difficult to find.

Gingerbread hornbooks were familiar in the eighteenth century, the pupil being allowed as a reward to eat the letter which he learned. Derivatives of the hornbook were the cardboard and wooden battledores on which the letters of the alphabet were printed. In spite of the great vogue of hornbooks, very few still remain, and their value, once 1*d* or 2*d*, has now risen to $100 or $150.

See Primer.

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Tuer, A. W. *History of the Hornbook.* (London, 1897.)

HORNE, THOMAS (1610–1654). — Headmaster of Eton College, 1648–1654. He was educated at Magdalen Hall, Oxford, 1624–1628. Between leaving Oxford and becoming headmaster of Eton, Horne had taught a private school (*c.* 1633) in London, had been master of the Free School at Leicester for two years and headmaster of Tonbridge School from 1638 to 1848. His son William became headmaster of Harrow. Horne was a translator of the *Janua Linguarum* — as drawn up by William Bathe or Batæus (1564–1614), head of the Irish College of Jesuits at Salamanca. The book therefore is to be distinguished from the *Janua Linguarum* of Comenius (*q.v.*), who borrowed part of the idea from the Salamanca *Janua.* Horne's editorial work on the Salamanca *Janua* is more careful than that of John Harmar (*q.v.*). He revised the English of the former version of William Welde and John Harmar, edited the Latin text of the *Janua,* altered the order of the words, and added marginal notes. It is interesting to note that Thomas Horne was the last translator into English of the Salamanca *Janua Linguarum* (1645) and the first translator of Comenius' *Janua Linguarum* (said to have been published as early as 1634). In 1641, while headmaster of Tonbridge School, Horne published *χειραγωγία — sive Manuductio in Aedem Palladis.* This book discusses the most valuable method of reading good authors. It is one of the best works of the period for showing contemporary school aims in the teaching of classics. Horne realizes the place of observation and comparison of words and sentences, as well as phrases, and epithets, and the mental discipline involved in the attention to the minutiae, of composition, and insists, as Vives and Ascham had done, on entries in paper books of all that has been observed in the reading of authors, and he gives a full account of imitation in writing. (See Commonplace Books.) Horne also wrote *Rhetoricae Compendium* (*Latino-anglicè*), 1651. F. W.

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Woodward, W. H. In *Otia Merseiana.* (London, 1899.) Gives a transcript of the Sloane Ms. 649, pp. 227–229 in Brit. Mus. Library — being a letter from Thomas Horne to Samuel Hartlib, Sept. 12, 1652.

HORTICULTURE, EDUCATION IN. — In North America, a group of subjects has been assembled in colleges of agriculture under the general name of Horticulture, including fruit-growing or pomology, flower-growing or floriculture, vegetable-growing or olericulture, and also ornamental gardening and the general glass-house and nursery subjects. It is not a homogeneous group, but it has so happened that persons have been trained to handle it as a coördinate to the group of general agriculture. The group of general agriculture has included the main or prevailing farm organization, the raising of staple foodstuffs and the rearing of animals; whereas horticulture has comprised many of the adjunct and amateur and semi-urban phases of farm life. The old pedagogical group of agriculture is being divided into its component parts, and in the most advanced of the colleges of agriculture, the word "agriculture" is no longer used as a name for courses; animal husbandry, farm mechanics, dairying, soil subjects, and others, have been separated out of it; and there is now a tendency to separate the farm-crops part into its units. Similarly, horticulture is in the process of division. In some institutions the three main parts are now separated or in active process of separation. Whether these and other parts of the subjects shall be treated as separate entities and be coördinated under one administrative unit known as horticulture, is mostly an institutional question; but there can be no doubt that now or in the near future the parts must be handled by different specialists. The horticultural industries have now become much differentiated and often highly specialized, and they frequently comprise entire farming schemes; and this calls for a very free handling of the subjects in the colleges.

In this country horticulture has developed as a college subject rather than as a common school or training school subject. Only very recently have we begun with much hope of success to found special separate horticultural schools on the plan of European establishments. The earliest special developments of horticulture in the colleges of agriculture appear to have been in Michigan under Tracy, Garfield, and successors (W. W. Tracy was assistant professor of botany and horticulture in the Michigan Agricultural College in 1867, and full professor of horticulture in 1869); New York (1874) and Ohio under Lazenby; Iowa under Budd, 1876. Probably the first full professorship in horticulture in a university, with no other name in the title, was that established at Cornell in 1888. Probably the first experiment station to employ a " horticulturist " was the New York Agricultural Experiment Station, at Geneva, 1882. At present, horticulture is represented by a department or in the title of an officer in practically all the American colleges of agriculture, and also in experiment stations; and the equipment in many cases is very large. In most early professorships horticulture was associated with botany, forestry, or landscape gardening. As a separate subject or chair, it was often an offshoot of botany. Although it touches affairs at every point, horticulture is primarily a biological subject, and it must always have the closest associations with botany.

The Field of Horticultural Education. — In the specialization in colleges of agriculture, some of the subjects that formerly were included in horticulture are segregated to separate departments. This is coming to be true of plant-breeding and of some of the other applications of botany. But the real field of the horticulture group still remains, sufficient in range and variety to attract the best effort of the very best men. In the applications, the colleges of agriculture must assuredly teach along the lines of public needs. The public needs in this field are well expressed in the kinds of horticultural societies that are now most prominent. The vigorous horticultural societies are of four kinds — pomological, floricultural, market-garden, and nursery business. These represent four great horticultural trades or occupations; persons who are expert in one of these occupations usually are not expert in others. Every highly developed horticultural department should have at least these divisions. If it is not desirable, in any commonwealth, to have a separate nursery sub-department, it will still be necessary to teach something of nursery practice as an underlying and coordinating part of all good horticultural work.

Each of these divisions must be in charge of a man who is expert in the trade, as well as thoroughly grounded in the science and philosophy of the occupation. The laboratory work should be abundant, and it should cover the whole theory and process of the given art. In the pomological division there should be a laboratory of, say, thirty acres of actual orchards, in which all phases of the work, from start to finish, may be in natural operation; and if these phases cannot be taught at the time of year when the students are in the habit of coming to college, the time of coming should be changed, for the seasons, and the operations that follow the seasons cannot be changed to suit a traditional college year. Similarly, in the other lines there must be ample areas that are used as teaching laboratories, — actual nurseries, actual glass houses of practicable extent, actual garden farms in operation. All the work, if it is to be of college grade, must be projected on a background of sufficient training in the natural sciences and the essential arts.

To meet the needs of rural civilization, it is essential that we build large and in such a way that the future necessities will expand our scheme rather than break it. In material equipment there must be (1) land, (2) a large area under glass, (3) orchards, nurseries, gardens, (4) buildings containing special scientific laboratories, libraries, classrooms, and the like, (5) museums.

The museums should be active teaching equipments. One museum might well contain cross-sections of all the kinds of greenhouses and all greenhouse appliances; another, all the spraying machines, and these machines might be used on occasion; another, the hand implements of horticulture; another, all the horticultural pottery; another, the horticultural products; and others will be needed. In addition, there should be living museums, — one containing the trees and shrubs (an arboretum); another containing the varieties of fruits; another containing the perennial and other herbs. There should be some one place in every state where all these various things are preserved and on exhibition for the information of students and the people.

There is another class of subjects that is yet undeveloped in horticultural departments. The dairy departments of agricultural colleges are largely manufacturing enterprises; they manufacture butter and cheese and other milk products. They cover a definite set of problems, and this is one reason why they are developing rapidly. There are also horticultural manufactures, — canning, preserving, evaporating of vegetables and fruits, the making of jellies and juices and other secondary products, — some or all of which should be investigated and taught by the colleges of agriculture. The utilization of the waste products of fruit growing and vegetable growing has scarcely begun to develop in this country; and the manufacture of the staple horticultural products is not yet taught.

As a School Subject. — In the public schools horticulture is not likely to be taught, in general, as a separate subject or class. Pieces of agriculture are put together into some kind of educational plan or sequence, and some of these pieces are derived from horticultural subjects. In particular schools fruit growing or flower growing or other applications may be introduced to meet local demands. Gardening may be made a most useful adjunct to school work, but its purpose in most cases — particularly in the formal school garden — is to provide a base for the development of nature study and for general training rather than primarily to teach garden culture as such. The influence of plants and of planting on children is not yet sufficiently understood. Horticultural subjects will be increasingly important as means of putting the pupil in touch with the situations in life.

There is undoubtedly to be a demand for special training schools and trade schools of horticulture. Probably some of them will soon be differentiated as floricultural or other technical schools. The fact that so much of the horticultural work is manual and is accomplished under glass, makes it very useful as a training subject. In the horticultural industries there will probably be an increasing field for women, and horticultural schools for women (one of which has recently been established in the United States) may be expected to arise near many of the populous centers.

Amateur Gardening. — Gardening is the great outlet of the amateur. No other phase of land work offers such variety, covers so completely the progress of the seasons, is adaptable to so many situations and climates, or allows such complete expression of personality. Therefore the teaching of amateur gardening is of the greatest importance both for country and town. In the colleges of agriculture the commercial aspects of horticulture are chiefly emphasized, but the amateur side may be expected to become prominent as the country matures. A different order of abilities is required in the teacher of amateur gardening from that demanded in the handling of education for the great commercial specialties, and we cannot expect the subject to develop strongly in the colleges until special teachers are provided. These teachers must be highly skilled in the feeling for plants and well trained in the skill of plant growing. It is probable that the special schools of horticulture, that are very strong on the manual side, will largely meet these needs, particularly for town lot and suburban gardening.

Literature. — There is a large American literature of horticulture, but there are no school textbooks among these writings (if we exclude school-gardening texts). All the texts on agriculture contain more or less horticulture; and horticulture is properly a part of agriculture. There are yet (1911) no books of college grade in the generalized horticultural field, that are prepared expressly as class texts, but many treatises on particular subjects are used as class books and reference books. Textbooks in fruit-growing, vegetable gardening, floriculture, and the like, will undoubtedly soon appear. They are particularly needed for college work. Manuals of various kinds will be helpful in the training schools. L. H. B.

Horticultural Education in Europe differs from similar work in America most conspicuously in the fact that it is never given as a part of a college or university course. Frequently there are given special courses of instruction, essentially like those provided in the several "short courses" of American agricultural colleges. The typical plan, however, is that of a special or "continuation" school, in which attention is focused directly upon the technical training, little or no attention being given to the questions or materials of general education.

One of the best of these institutions is the Horticultural Institute (*Königliches Gärtner-Lehranstalt*) at Dahlem, in the suburbs of Berlin. This institution is thoroughly typical; and a brief description of its organization will give a fair idea of how such work is conducted in continental countries. The institute owns a tract of approximately twenty acres of very excellent garden land inclosed by a high fence on all sides. Within the privacy of this in-closure live the director and a few workmen who are directly responsible for the care of the place. The plant consists further of a large classroom building, a small greenhouse equipment, and a small experimental laboratory. No students live in the institute buildings, though in many other places the residence of students is an essential part of the plan. About the buildings is a small tract laid off in ornamental gardens, containing on a small scale the usual features of an arboretum and nursery. A large collection of plants is made unnecessary through the close proximity of the unrivaled Berlin Botanic Gardens. There are extensive plantations of dwarf and trained fruit trees and of small fruits. Garden vegetables are cultivated on a smaller scale. The course of instruction covers two years, and is divided into three principal vocational lines: (1) garden art (landscape gardening), (2) fruit culture, (3) plant culture. Instruction is given chiefly by lectures, with occasional demonstrations and practicums. There is less field work, either required or voluntary, than in similar courses in American agricultural colleges. The reason for this lies largely in the fact that applicants for admission are required to present certificates showing one year of voluntary military service and three years of practical field experience. The work is designed, therefore, to meet the needs of men who have already entered upon their professions and who have a fairly substantial groundwork of experience upon which to build their theoretical education.

A number of the European schools are founded by particular societies or by local municipalities, in order to assist special industries.. There is, for instance, a school for the canning industry in Brunswick, a district where large quantities of fruit and vegetables are canned; there is a school especially adapted to the needs of vine growers at Geissenheim, in the wine district; and so on. Similar local schools, some highly specialized and some more general in their scope, are to be found in Switzerland and Austria. The National School of Horticulture at Versailles is the most important one in France. In England there are several horticultural schools, mostly of a strictly local nature, the one at Wisley being perhaps the most famous. In this connection, however, the work at Kew should never be forgotten. Here many of the best gardeners have received their training. The apprentice system is, however, the most popular method of training gardeners in England, and is in general the typical method of horticultural education in that country. F. A. W.

See Agricultural Education; Botany; Gardens, School.

For references to the general field see under the articles here referred to.

HOSPITAL ECONOMICS. — See Nurses, Education of.

HOSPITAL SCHOOLS. — A hospital means primarily a guesthouse, and may be defined as an endowed inn or public house for the reception of guests gratis, whether they were travelers, poor, aged, children (especially orphans or foundlings), or sick. Hospitals seem to have been unknown to the ancients, Greek or Roman, in classical times. The Jews dispute their invention with the Eastern Christians, but the balance of evidence is in favor of the latter. The earliest hospital known to history appears in the middle of the fourth century A.D., when Eustathius appointed a superintendent of the Hospital (*xenodocheion* or *ptochotropheion*) for the poor at Sebaste in Pontus. Epiphanius speaks of it already as a custom for bishops to maintain such institutions (*Hieres*, 75, c. 1). One of the first acts of Basil the Great (*q.v.*) on becoming Bishop of Cæsarea was to include hospitals for travelers, the poor and the sick in the institutions which he founded. Julian the Apostate directed the establishment of state hospitals as rivals to those of the Christians. The Council of Chalcedon in 451 placed the clergy in charge of hospitals on the same footing as churches, and Justinian (*Codex* I, 42, 46) deals with the five classes of hospitals under the heading of "bishops and clergy."

From the first hospitals became connected with education. Among the earliest hospitals were orphanages and foundling hospitals, owing to the prevalent pagan practice of exposing infants and deserting children. Constantine the Great himself established an orphanage at Constantinople, and formally sanctioned the gift of endowments to them. The warden of orphans (*orphanatropus*), a priest, was a high official. The orphanage became the song school (*Scola Cantorum*), and in Greek rituals the term "orphans" was used as equivalent to choir boys.

The earliest mention of hospitals in England is found in a letter written by Alcuin (*q.v.*) to his old pupil Eanbald II, in which he recommends to the newly made archbishop the establishment of guesthouses (*xenodocheia*), that is, hospitals (*hospitalia*), at the same time that he discusses the organization of the school. St. Peter's, afterwards called St. Leonard's Hospital, which has been imputed to King Athelstan, *c.* 932, may well have been founded by Eanbald II on Alcuin's advice and augmented by Athelstan. By 1280 this hospital was used partly as a foundling hospital "ministering to the poor and sick and to infants exposed there." There were twenty-three boys in the orphanage under charge of a woman, and they, together with no less than thirty choristers, were educated, two masters, one of grammar and the other of song, being maintained to teach them. The dean and chapter of York attempted to close the school in 1340 because the master was unlicensed; but the King upheld the school as a royal foundation, and "free from all ordinary jurisdiction." The two schools were still being maintained in the Hospital in 1535, and only ceased on the dissolution of the hospital, when the Cathedral Grammar School was put on a more substantial basis.

At the Hospital of St. Cross, near Winchester, founded in 1132 by Bishop Henry of Blois, thirteen poor men were maintained, and dinners were provided for a hundred other poor. In evidence given in 1373 it appeared that among the hundred poor men had always been included " thirteen of the poorer scholars of the High Grammar School of the City of Winchester." There were also attached to the hospital four hired priests, and, probably a later addition, "thirteen poor secular clerks' scholars," and seven poor grammar (*litterati*) boys, two of whom were called choristers and the rest served in the church, " and the services finished, attended school in the same hospital." In the same manner three scholars of Durham school received food, drink, and beds in St. Cuthbert's Almshouse at Durham (1190). In the case of the Hospital of St. Katharine by the Tower, founded in 1147 for thirteen poor women, six scholars were added in 1272 to act as choristers in the Hospital chapel or church. The six poor scholars are now represented by two elementary schools, one for boys and one for girls, in Regent's Park, London, since 1826. At Norwich Bishop Suffeld founded in 1249 what is now known as the Great Hospital, originally God's House or St. Giles' Hospital, intended for the infirm, under a master, four chaplains, and four sisters. In addition to thirteen poor people who were daily to receive dinner, there were also seven poor scholars who were to be named by the master of the grammar school. By 1430 the seven poor scholars had become choristers in the Hospital church. The Hospital was dissolved by Henry VIII, who, however, provided for its reconstitution by his will, and in addition to the Hospital a grammar school was to be established with a " scolemaister " and usher " to teche frely without any reward other than their stypends of £10 and £6. 13. 4. and convenient houses." At Bridgewater in Somersetshire the rectory of Wembdon was appropriated in 1285 to the Hospital of St. John, founded before the reign of King John, for maintaining six more chaplains and " thirteen poor scholars of ability to learn grammar, who should be maintained in the Hospital but attend the school of the town daily." Seven other poor scholars of the school were to receive daily pittance from the hospital kitchen, pottage, etc. These boys were still being kept in this way in 1535, the date of the *Valor Ecclesiasticus*. Precisely the same arrangement was made at York, where St. Mary's Abbey kept a boarding school for fifty boys who attended the cathedral grammar school.

Instances proved by contemporary documents of the definite endowment of university education in connection with a hospital are that of the Englishman Joyce or Joicey at Paris, in St. Mary's Hospital, a room in it with eighteen beds being set aside and stipends provided for eighteen scholars or clerks. (See COLLEGE.) This arrangement was imitated in the first university college in England, the House of the Valley Scholars, founded at Salisbury, in 1262, by the Bishop Giles of Bridgeport, in connection with and apparently in the precinct of the Hospital of St. Nicholas there. (See Rashdall, *Universities of Europe*, Vol. II, p. 766.) So Merton, the earliest college at Oxford, was in connection with a hospital for the poor at Basingstoke, Hampshire, to which the scholars might themselves retire when old or incapacitated. In like manner St. Bartholomew's Hospital at Oxford was annexed to Oriel College in 1325, and St. Julian's Hospital, Southampton, to Queen's College in 1340. The colleges maintained the poor, but took all surplus to themselves. The earliest Cambridge college was originally planted in St. John's Hospital there in 1280. But the brethren of St. John's were "regulars," and could not get on with the secular scholars, so in 1286 the scholars were removed to what is still called Peterhouse. St. John's Hospital was itself dissolved under a Papal Bull and converted into the present St. John's College in 1504, just as St. John's Hospital at Oxford had been dissolved by the Pope and converted into the present Magdalen College, Oxford, in 1480. Both were following many precedents in connecting scholars with hospitals, though not of actual dissolution and conversion of one into the other.

How much neglect and malversation there were in the management of hospitals may be seen from the decree, *Quia Contingit*, of the Council of Vienne (1310–1311), which appears in the *Corpus Juris Canonici* (Clement III, tit. XI, 2) under the misleading title of " Religious houses and their subjection to bishops." Most hospitals were then in the hands, not of secular clergy, but of the religious or regulars, particularly the Augustinian canons. By this decree the Ordinary is given power to investigate and reform hospitals, which were no longer to be conferred as ecclesiastical benefices. An exception was made in favor of the military orders, the Knights of St. John, and the religious, who were only to be subject to their own superiors. In England the first Parliament of Henry V at Leicester in 1414 investigated similar conditions and empowered the ordinaries to hold inquiries and reform the hospitals. There was a tendency more and more in the fifteenth century, with the disappearance of leprosy, to convert the funds of hospitals to other uses; many hospitals became almshouses, and many were connected with educational purposes. Thus William de la Pole, Earl of Suffolk, founded an almshouse, in which he also planted a grammar school, at Ewelme, in Oxfordshire (the license being granted in 1437 and the foundation statutes made not earlier than 1448). The " Howse of almesse " or " Goddis Howse " was to consist of two priests and thirteen poor men; one of the priests was to be "apte and able to techying of gramer, to whose office it shall longe and pertayne diligently to teche and informe childer in the faculte of gramer." The children of the lordship of Ewelme were to be admitted to the school without tuition. The Hospital remains almost intact, but the school has been sadly modernized and mauled to make it an elementary school and so save a few pounds in rates. This institution is of great historical importance, as the Earl of Suffolk was one of Henry VI's main agents and advisers in the foundation of Eton, which probably owed its being in part as almshouse to his influence and example. To the same influence may perhaps be attributed the school of St. Anthony's Hospital, in Threadneedle Street, for about a century and a half one of the most famous of London schools. In 1441 the rectory of St. Benet Fink was appropriated to the Hospital founded in 1253 for sufferers from St. Anthony's Fire, and later (1441) continued as a hospital for the poor merely. The endowment of the rectory was intended for the maintenance of "a master of fit Informers (*Informator*) in the faculty of grammar to keep a grammar school in the precinct of the Hospital or some fit house close by to teach, instruct and inform freely (*gratis*) all boys and others whatsoever wishing to learn and become scholars (*scolatigare*)." It was a school precisely on the same lines as Eton (*q.v.*). A song school had been already established in the preceding year for the choristers of the hospital. New statutes were made for the hospital in 1446, and in 1447 the hospital was brought into connection with Oriel College, Oxford, by maintaining scholars studying there. In 1475 the hospital was annexed to St. George's, Windsor, and suffered thereby, for the canons, wishing to increase the surplus payable to themselves, cut down the salaries of the masters. The school, however, flourished in numbers, and according to Stow, who was probably a boy there, St. Anthony's Hospital "commonly presented the best boys and had the prize in those days" at the disputations held in St. Bartholomew's Midy on St. Bartholomew's eve (August 23). A regular feud existed between St. Anthony's boys and those of St. Paul's, the former calling the latter pigeons, because of the pigeons inhabiting then as now the churchyard; and the Paulines calling the Antonies "pigs," because all stray pigs were the perquisites of the hospital. In 1589 the school had sunk to little more than a parish school, but it continued till the Fire of London in 1666, after which it perished and was not rebuilt. The endowment was swallowed by the dean and chapter of Windsor. At about the same time the greatest of London Hospitals, then as now, St. Bartholomew's, was connected with education. In 1444 John Stafford, chaplain and citizen of London, left property to the master of the Hospital, including among other things "for the increase of the clergy and of divine service" £1. 13. 4. a year more "for the diligent instruction of boys in grammar and song." This school has been left unnoticed by historians of the hospital, although it may well have contributed to the establishment of the grammar and song schools in Christ's Hospital, when a scheme was made for the four great London hospitals at the end of Edward VI's reign. While in the fifteenth century, far from a period of decadence in learning, schools were added to hospitals, in the sixteenth hospitals were boldly annexed and converted to educational uses, *e.g.* the Hospitals of St. John at Oxford and Cambridge. In 1501 John Stansbridge (*q.v.*) became master of the Hospital of St. John the Baptist at Banbury, which was treated as a school and the mastership as a schoolmastership rather than as a hospital and ecclesiastical preferment. The school seems to have ceased in 1558.

The *Valor Ecclesiasticus* of 1535 revealed the extent to which the hospitals were mismanaged. In one after another there were only one or two poor, and the master took nearly the whole of the revenues to his own use, and where there were none he took the whole. A large number of hospitals were still in the hands of the regulars. The acts for the dissolution of monasteries also included hospitals. So fell the Hospitals of St. Bartholomew and St. Thomas in London and Southwark, only to rise again in enlarged form.

The greatest of all hospital schools was that of Christ's Hospital, London, founded in 1553. This was the only educational institution really founded by Edward VI in the sense of creating a new school where none had existed before; and it was not founded as a school or for education primarily, nor was its site nor a penny of endowment given by Edward VI. His contribution to it consisted of a piece of parchment and some confiscated church linen, and the name of "the Hospital of Christ, Bridewell and St. Thomas, the Apostle." Christ's Hospital was the deserted monastery of the Grey Friars, the Franciscans or Friars Minor, one of the largest churches in the city next to St. Paul's. It was acquired by the city from Henry VIII in 1547, and in 1550 the Lord Mayor, Sir Richard Dobbs, brought before the Court of Aldermen a plan for the suppression of vagabondage and poverty by taking "out of the streets fatherless children and other poor men's children that were not able to keep them to the late dissolved house of the Grey Friars, which they decided to be a Hospital for them." In 1552 the Grey Friars was prepared as Christ's Hospital by the subscriptions and contributions of citizens and the common council. This was part of a general scheme to deal with every class of destitute poor, and the charter included the "Royal Hospitals" of Christ, Bridewell, and St. Thomas," which with

St. Bartholomew's, which the city already had, made up the "Four Royal Hospitals." In November, 1552, 380 children were admitted into it. It appears from the evidence of a contemporary, an official of the Hospital, that it was a Foundling and Orphan Hospital for "gutter" children, and this is confirmed by the names on the admission book, which, however, only begins in 1556. In 1639 it was ordered that no child be admitted under three, but even as late as 1653 out of 218 children 120 were under four. In 1677 a rule was made excluding children under seven. Education is so far mentioned in this charter in that it says that one of its objects is that "neither children yet being in their infancy shall lack good education and instruction nor when they shall attain riper years shall be without honest callings and occupations, nor that the sick or diseased when returned to health may remain idle and lazy vagabonds but in like manner may be placed and compelled to labour." Grafton, the printer, however, who took a principal part in the establishment of the Hospital, and others were fully convinced of the necessity of educating their foundlings and orphans. They put in two "scholemaisters for the petties in ABC" at £2. 13. 4. a year, 13*s.* 4*d.* more than the barber and not half what the porters got; a "teacher to wrighte" was paid £3. 6. 8. a year; a teacher of pricksong £2. 13. 4; a "scholemaister for musicke" £2. 13. 4. But they also provided for a "Grammar Schoole mayster" at £15 a year and a "Grammar Usher" at £10 a year. Grafton was put into the Fleet prison in Queen Mary's reign because he allowed "the children to learn the English primer instead of the Latin absies [A B C's]," the latter having the Paternoster and prayers in Latin. At first the children were clothed in russet (brownish red cotton), but at Easter, 1553, they appeared in the blue cloth which has made the "Blue coat boy" so famous throughout the world. But whereas of later years they have been noted for going about bareheaded, they originally had red caps. Queen Mary wished to suppress the Hospital and put back the Friars, but the Spanish Friars themselves advised against it. Only one endowment was given in her reign, but in Queen Elizabeth's subscriptions, bequests, and legacies poured in, and by Camden's time, about 1590, 600 children and 1240 pensioners were maintained. But of these not more than 200 were in the Grammar School, and only those who attained the two highest forms, "Deputy-Grecians" and "Grecians," were retained after the age of sixteen. In 1673 the above boys were increased in number by the Mathematical School of forty boys founded by King Charles II to prepare them for sea — one of the earliest institutions of its kind in recognizing that a classical education was not good for all boys. In 1774 the girls were moved to a separate establishment at Hertford, where a nursery, afterwards transformed into a preparatory school had long been established. The number was then 800, of whom about 200 boys under twelve were at Hertford. Under a scheme of the Charity Commissioner in 1890 the boys' school was removed in 1902 to Horsham to an ample site and splendid buildings. For about 150 years before the scheme the Hospital was practically governed by those rich enough to pay £500 for the privilege of being governors and having the patronage of appointing the boys, with the result that the class of boy had been more and more raised in wealth and the class for whom it was intended was no longer found. A third of the boys are now admitted by competitive examination from elementary schools, and to that extent the original class has now been restored. (See Grammar School; Public Schools.)

The Blue Coat School, as it was commonly called, became a model for other foundations of the same sort, though none of them attained the size or fame or educational advancement of Christ's Hospital. The earliest of these was Emanuel Hospital, Westminster, in 1594; the Charterhouse, which combined an almshouse for decayed gentlemen with a grammar school in the old Carthusian Monastery of London in 1611, but this catered more for the lower classes like Christ's Hospital; the Blue Coat Hospital, in the old St. John's Hospital, Exeter, followed in 1632; the Green Coat Hospital, Westminster, 1633; Chetham's Hospital, Manchester, 1651; the Grey Coat Hospital for girls, Westminster, 1706. Scotland also in George Heriot's Hospital in Edinburgh, 1628 (see Heriot, George); Gordon's Hospital, Aberdeen, 1732 (see Gordon, Robert); and diverse others, including Morgan's Hospital at Dundee, building in 1867, followed the example. (See also Hutcheson Educational Trust.) A new crop on a smaller scale sprang from the Charity School (*q.v.*) movement in 1705, of which one of the largest remaining is the Blue Coat School at Sheffield. These later ones aimed rather at training children for domestic service, and gave no more than a purely elementary education, and were strongly condemned by the Schools Inquiry Commission in 1867 as wasting large funds for no appreciable educational result or advancement of the children. Many of them, like Emanuel Hospital, Westminster, now the Westminster City School, have been turned into higher grade or technical day schools, meeting a much-felt want in large towns for commercial and technical education of the poorer boys. The connection of hospitals with general education has now practically ceased, except in regard to medical education and training, which are treated under a separate article. (See Medical Education.) A. F. L.

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HOSPITIUM. — See DORMITORIES; HALL; UNIVERSITIES; STUDENT LIFE.

HOSTEL. — See DORMITORIES; HALL.

HOT AIR FURNACE. — See HEATING OF SCHOOL BUILDINGS.

HOT WATER SYSTEM. — See HEATING OF SCHOOL BUILDINGS.

HOUSEHOLD ARTS, HYGIENE OF. — See MANUAL TRAINING, HYGIENE OF.

HOUSEHOLD ARTS IN EDUCATION. — **Terminology.** — Various terms have been used to indicate the content of this broad subject, to signify its connection with the home, and to indicate the fact that science, fine art; and the technical arts are fundamental. The terms most in vogue at present are either home economics, household science and arts, household science, or household arts. The English Board of Education has introduced the term " housecraft " (1911). The term " economics " is perpetuated in the American Home Economics Association, and is used in a number of institutions. The term " household science and arts " would seem to include everything required, but it is inconveniently long. Household science does not include the art application. Household arts, on the other hand, while it seems to emphasize the practical or applied side, also implies a scientific and artistic basis. This last term is coming into common usage in both the elementary and secondary schools, and its use is spreading in higher institutions. Other suggested terms are " Eugenics " or " Euthenics " (freely interpreted, the art of right living). The term " household arts" covers all that has been included under the terms "domestic art" and "domestic science," together with other more recently developed industrial, economic, and hygienic aspects of home activities.

Historical Development. — In certain forms, the subject has had a long history. In the theoretical treatises on education some phases of the subject are advocated in the sixteenth and seventeenth centuries, when Comenius (*q.v.*), and, in a more general way, Luther (*q.v.*), and many others emphasized the educational value of household activities. In the eighteenth century the philanthropinists (*q.v.*) gave stronger expression to this belief, and at the opening of the nineteenth century Pestalozzi (*q.v.*) and other reformers began actual experimentation for educational purposes. Earlier than this the institutions of the philanthropinists of Germany and the charity schools (*q.v.*) of England had emphasized such activities quite generally for practical purposes. The monitorial schools of Lancaster and Bell usually included some instruction of this character. Needlework was commonly found in all private schools for girls. Sewing especially had a high social status, and in the finer forms of lace making and embroidery was incorporated in the private schools for the well-born as a part of the " finishing education " of girls, so popular during the eighteenth century. The claims for recognition of the domestic arts of cookery, laundry work, housewifery, and needlecraft in the curriculum of school or college received sparse recognition in Europe before the middle of the nineteenth century. After that date their introduction into any scheme for the education of women or girls was for many years gradual, partial, and tentative. During the last twenty-five years, there has been developed a remarkable range of diversified and more or less highly organized courses of instruction in primary and secondary schools, technical institutes, training colleges, universities, and institutions working for social betterment. Peripatetic courses of instruction are arranged in many countries for rural districts; while post-school courses, residential or otherwise, provide for the needs of farmers' daughters or girls of the leisure classes. In the United States these subjects have received university recognition in the form of college courses for under and post graduate students. In Germany, the United Kingdom, and Ireland, and in Norway and Denmark, increasing attention is given to the study of the scientific principles which underlie the practical processes. In the United States about the earliest recognition of this field was given by Miss Catharine E. Beecher (*q.v.*), a pioneer in woman's education, who published (1840) *A Treatise on Domestic Economy for the Use of Young Ladies at Home and at School.* In England Hannah More (*q.v.*), in the late eighteenth century, had written on the subject. The local development of practical training relating to household arts subjects is given briefly in the sections on the separate countries. (See also BELGIUM; FRANCE; etc.)

Aim of Instruction in Household Arts. — In its historical development the group of subjects may be looked upon as a part of the modern movement for an education that shall better fit for daily life, a so-called practical education. More specifically it is an effort to better the home life of the people, which originated everywhere outside of, rather than in, the school system. The movement in the schools was strengthened by the development of other handwork, the subjects formerly classed as manual training, which included handwork for girls as well as for boys. The earlier realization that systematic school training in these home arts was desirable, and the later conviction that their importance justifies, if it does not compel, their adoption as school studies, are the outcome of: (1) the growth of preventive medicine and hygiene; (2) the desire to counteract the disintegrating influences upon home life and industry of modern industrial and social changes; (3) the recognition of women's needs in respect of technical and professional training; (4) attempts to solve the problems of domestic service.

If the fifteen or sixteen nations in whose educational institutions this teaching is now general are grouped into three divisions, the fact becomes apparent that the individual philanthropists or societies which started the movement in each country were prompted by one or more of these motives. State recognition and support is now invariably accorded with greater or less cordiality to this instruction; but the pioneer work has been uniformly carried out by philanthropic service and supported by private funds.

Three groups of countries may be made according to the underlying aims: (1) The amelioration of home conditions, and the improvement of existing domestic work and methods (United States, Great Britain, Ireland, Germany, Belgium, Finland, Denmark, Norway, and Russia). (2) The solution of the problem of domestic service, although there is now a tendency to move in the direction of the first group (Sweden, Holland, Austria). (3) Vocational and professional preparation (France, Italy, Hungary, and to some extent also Belgium and Switzerland). In Spain, Portugal, Greece, and Roumania the study of the domestic subjects is still in its infancy, and attention is limited only to one or two branches.

Much of the inspiration which led in 1889 to the simultaneous organization of cookery classes in Sweden, Norway, Finland, and Germany sprang from Great Britain, where the pioneer teachers in the first three of these countries secured their training. Though the standard of training varies very widely (from three years to six weeks), wholly untrained teachers are now permitted only in France and Austria, and in the rural districts of Switzerland, Norway, and Sweden. State inspection of classes is general throughout Europe. All teaching is gratuitous in primary schools, usually so in classes for factory workers, and occasionally for adults. Fees, when charged, are always low, necessitating heavy state and local subsidies. The urgent needs of the poorest classes dictated the utilitarian methods general in these courses; but in the girls' secondary schools of Norway, Belgium, Germany, Great Britain, and Ireland, the tendency is now to connect them closely with laboratory work in elementary science and with art studies in the studio. Contrary to the usual custom, these subjects first found a footing in the secondary schools of Russia, Germany, and Denmark, but they are not yet generally adopted into primary education in these countries. Special training for matrons in institutions, asylums, etc., exists in Russia and Italy; Norway and Holland provide special instruction for soldiers and sailors. Efforts to solve domestic service problems by special training though attempted in several countries have had but moderate success.

General Content. — When household arts began to form a subject of study in the United States, cookery, sewing, and housewifery were prominent. The need of scientific and artistic foundations was soon felt. Chemistry, physiology, and physics were early required in the course of Domestic Science. The science required was, however, elementary; but requirements have since been raised. Since the importance of the home for individual and social welfare has been recognized, emphasis has been placed on the principles and practices that have to do with the proper conduct of the home. The training of a better class of wage earners is considered on the industrial side, so that from this point of view household arts may be classed as a social science and as a branch of economics. Thus the subject has passed through three stages of development, all of which must now be given weight: (1) practical, (2) scientific and artistic, (3) economic and sociological.

The general divisions of these fundamental problems are as follows: (1) The food supply: its production, manufacture, transportation, and cost; good quality in food, food sanitation, pure food and inspection laws; how to buy; composition and nutritive value; dietaries and menus; preparation and serving. (2) Clothing and other uses of textiles: textile fabrics, their primitive beginnings, their connection with the development of civilization; textile arts and crafts related to clothing and shelter; modern manufacture and cost of textile materials; textile adulterations; functions of clothing and costume in health, beauty, and ethics of life; the wardrobe, its repair and care; the making of garments, hats, household articles and furnishing; design in textile garments and household furnishing. (3) Shelter: the cost of building, rentals, and taxes and insurance; house architecture, sanitation, and mechanics; household furnishing, for convenience, economy, and beauty. (4) Housewifery: processes of cleansing, preserving, and renovating all household materials, including laundering. (5) General management: the budget, accounts, savings, insurance; system in purchasing; inventories of household goods; household labor; relations of employer and employee; division and order of work; labor-saving apparatus. Town and state laws that affect the householder. (6) Care of the family: special needs of individual members, as infants, children, the elderly;

home care of the sick; family needs and duties; mutual occupations and recreations; hospitality; municipal and state responsibilities of the householder in connection with city and state sanitation. (7) The employment of women in industries, their occupations, wages, clubs, settlements, pleasures, education, plans of betterment; woman as a citizen, and her relation to civics and the government.

Household Arts in the Elementary Schools. — Under the influence of the culture epoch theory (*q.v.*) many of the simple industrial and household processes have been introduced into kindergartens and the early grades of school. Courses in sewing under special teachers seldom begin before the fifth or sixth grade, and in many schools they are connected with lessons in design and discussions on textiles. The handwork in the better class of schools is on interesting articles connected with the home or the school. Previous practice of the stitches is given, but the " model system " requiring perfect work has long passed away. Organized courses in cookery and other forms of home work are not usually given before the seventh or eighth grade, although in view of the fact that many pupils are then likely to leave, they are advisable in the sixth grade. The subject usually includes lessons on nutritive values and buying. With the present tendency to give vocational training in the last few grades of the elementary schools, cookery, sewing, millinery, and dressmaking have been given an industrial bias, and are broadened and strengthened by academic and art work, as they apply to the occupations. To meet the exodus from the sixth and later grades many cities have organized special household arts' work in the afternoons. With this vocational preparation is also growing up very slowly a system of vocational guidance (*q.v.*).

The courses are still tentative, and need a further working out in practical correlation with academic work and art and with determination of the length of time which should be devoted to the different subjects and the elimination of unnecessary material. The domestic art work in the higher grades is usually conducted in the schoolrooms, although a special laboratory is provided in a few schools. Domestic science requires a special kitchen. Much discussion is centered about the use of individual equipment with small quantities of food and the group system around a large range or stove. Most school kitchens are now equipped for individual work on the part of each pupil. It is felt that this method helps to economize material and tends to develop the pupil's initiative, but it does not always give the ability to deal with the practical problems of cookery in the home as well as does the group method. Where the pupil cannot have enough material to make the process really practical, the best practice should include both individual and group work.

There are many practical questions of time division and laboratory management and equipment, but at the present there is much divergence of opinion in different parts of the country. Definite results, therefore, cannot be given. In general it may be said that in the lower elementary grades the time allotted is usually from twenty minutes to one half hour. The processes and manipulation are simple, and are conducted by the regular teachers in the grade rooms. In the sixth, seventh, and eighth grades the common practice is three quarters of an hour twice a week for two years for sewing and one and one half hours once a week for one year for cooking. It is felt, however, for the latter subject that two periods per week would be better.

Household Arts in the Secondary Schools. — Here the work in household arts is too new to have evolved an ideal course. There are different points of emphasis; in some cases there is an attempt to organize courses to secure college credit; in some the courses vary according as the previous training of the teacher concerned was in art or science; in other cases the previous training and the future of the pupils is taken into consideration. There is also considerable variation according to the type of school; thus the classical high schools, if they do not neglect the subject, offer it as an elective or require it for one year, perhaps with electives in later years; the manual training, technical, or practical arts high schools and the recently organized trade schools offer extensive work, often in close connection with business methods, when the students expect to become wage earners. The tendency is now not to leave the different subjects, *e.g.* sewing, dressmaking, millinery, cooking, etc., isolated from the rest of the curriculum; but the controlling aim is to give the students insight into the industries as they affect home and national life, into possibilities of greater economy in living, as well as higher ideas of woman's municipal responsibilities. Thus the courses are being gradually related to instruction in art, science, industrial history, geography, and arithmetic, and courses in home sanitation, chemistry of foods, nutrition, dietaries and menus on the one side, and household management, house furnishing and a study of costume on the other.

In the secondary school the method and organization are essentially the same as for the elementary, but longer time is given to discussion. The same principle holds good in regard to the number of lessons and the length of laboratory periods. In both domestic art and domestic science from thirty to forty-five minutes a week are necessary for the best development of the subject through discussion, which would include a review of the past laboratory work, plans for that which is to be undertaken, and the development of economic and social ideas. The teacher is much hampered by the lack of suitable textbooks, since those that are written accurately are usually too advanced for high school pupils. The *Bulletins* of the United States Department of Agriculture, of the various associations of Textile Growers and Manufacturers, and the *Bulletins for Farmers' Wives*, published by Cornell University, afford material from which the teacher can assign some work to be discussed in class. Laboratory methods in the practical work in cookery and garment-making and in the housekeeping of the cookery laboratory do not differ essentially, although in some places the experimental method may be used to a greater extent and the pupils trained to work with a larger degree of independence.

In a technical or trade school, however, where preparation for a livelihood is given in the fourth year, a large amount of practical work, requiring at least four hours daily, should be included. The content of a course that counts for college entrance should be more intensive along scientific lines than one training for home work or for a livelihood.

Household Arts for General Training in College and University. — Since the secondary schools frequently offer little or no preparation, the college courses in household arts are necessarily elementary. Domestic art offers a study of textiles including microscopical work on fiber, chemical testing, dyeing and weaving, art in the design of costume, interior decoration, household furnishing, household economics, and craft work in dressmaking and millinery. Many colleges now offer courses in foods and in the chemistry of nutrition and sanitation, which require not only elementary but organic chemistry and biology as prerequisites. Practical courses are given, but usually in the freshman year and sometimes not for college credit. Most of the colleges agree in placing a course in household administration in the senior year, presupposing a study of nutrition and some of the domestic art subjects. History of industry and at least one course in economics or sociology are also required in connection with the household arts' work. Where the subject counts for credit about one third of the students' time may be devoted to household arts.

Normal Courses. — The content of these courses varies with the institution; but where diplomas, or degrees, or both are granted, there are given courses in art as applied to costume and house decoration, chemistry as applied to food and textile tests, biology, bacteriology, and sanitation, dietetics, practical work in cookery, millinery, and dressmaking, and housewifery, laundering being sometimes included. Courses in the study of textiles as applied to the economic training of the consumer are rapidly developing, and in addition, courses in pedagogy and practice teaching. The chemistry covers elementary (sometimes a prerequisite) and frequently organic chemistry of foods and nutrition, and in a few instances physiological chemistry.

In college, university, and normal schools the method is parallel with the teaching of other college subjects. Lectures, discussions, and notebook work may be as accurately and scientifically conducted as in any of the natural sciences or academic studies. There is no dearth of sound reference books, so that readings may be assigned and required, although the majority of those dealing with textiles are written from the point of view of the mill and those on art in dress and home decoration are rather trivial. Here, and especially in advanced work, the opportunity opens up for individual research, with all the possibilities of exact training that such work affords.

Equipment and Cost of Maintenance. — These of necessity vary from country to country, from region to region, and from school to school. In some instances equipment runs to the extreme of expense and elaborateness; in others an effort is made to produce results with the simplest possible equipment, or at least that which approximates the home conditions, possible or actual, of the children. Equipment ranges from the simplest materials furnished by the child to whole buildings expensively furnished. Any statement of details would of necessity be of suggestive value only and can be obtained from much of the practical literature bearing on the subject, to which reference is given in the appended bibliography.

United States. — *Historic Development.* — Instruction in the household subjects originated outside of the school system and in its modern form sprang from the renewed interests in all these lines at the time of the Philadelphia Exposition in 1876. The work was started in the eastern cities and was supported by private funds in classes outside the schools. Less successful attempts had been made earlier. In Boston an attempt was made to introduce sewing into the lower grades as early as 1854. This met with little success until 1865–1866. Special schools of cooking were established in the two cities. Public demonstrators and lecturers aroused public interest, and later a demand followed for the training of teachers. Cooking schools were begun privately in Boston, *e.g.* by Miss Joanna Sweeney in 1874, in 1877 by Miss Maria Parloa, later a teacher in the Lassell Institute, whose president had been interested in the teaching of cookery in the South Kensington School. In 1879 the Woman's Educational Association of Boston voted to support a cooking school and made a contribution towards it, and on March 10, 1879, the Boston Cooking School was opened, in which demonstration lessons were given to young ladies, cooks, and girls. The school was put on a permanent basis in 1883, and in 1903 was incorporated with Simmons College. Cooking classes and kitchens were gradually provided in Boston schools and were taken over by the public school system in 1885. A normal class was held in the Tennyson Street School in 1886, and the Normal School of Cookery, which later became the Mary Hemenway Department of Household Arts in the Massachusetts State Normal School at Framingham, was opened in 1888. The School of Housekeeping, which was incorporated with Simmons College in 1902, was opened as a private institution in 1897.

In New York City in the early seventies, the churches opened sewing schools. In 1876 the New York Cooking School was opened and was incorporated in 1878. It is now conducted in the United Charities Building. The Kitchen Garden Association of New York was incorporated on April 10, 1880, and included in its objects the promotion of the domestic industrial arts among the laboring classes. In 1884 this association became the Industrial Education Association. To meet the demand for teachers of sewing the first normal class was begun in 1884 as a part of its work. Instruction consisted of technical sewing alone, for methods of teaching the subject had not yet been completed. Classes in cookery and domestic art were held for public school children, and classes where girls could be trained for domestic service were also opened. In the winter of 1886 a children's industrial exhibition was held, representing sixty schools and institutions from different parts of the Union. This brought children's handwork before the public and had a direct influence in the development of the work in schools. In 1888 the College for the Training of Teachers, with a model school, was organized out of the Industrial Association, the name being changed to Teachers College in 1892. In 1911 the School of Practical Arts was differentiated from the other pedagogical departments and thus the household arts subjects again became a central object of instruction. As early as 1888 both cookery and sewing were introduced as regular subjects into the New York City public schools, one teacher being employed for each subject. Pratt Institute, Brooklyn, N.Y., founded by Mr. Charles Pratt, was opened in 1887, and science and domestic arts were included at the beginning.

In Philadelphia classes in cookery were offered by the New Century Club in 1878. These classes developed into a cooking school under the direction of Mrs. Rorer, which continued for twenty-five years. Drexel Institute, Philadelphia, was founded in 1891, and instruction was begun in 1892. Domestic science and art were important departments at the outset. Cookery and sewing were introduced into the elementary public schools of Philadelphia in 1885, and had found a place in the Girls High and Normal School in 1880.

The World's Fair at Chicago (1893) with exhibits from Sweden and other European schools gave an impulse to sewing as a school subject. In the fall of the same year the New York Association of Sewing Schools was formed and served as a center of information concerning courses, methods, and training, held conferences and exhibits, and issued publications; it grew into a national society and had great influence in the introduction of sewing as an educational subject into schools of various rank in the United States. In 1901, the society, considering its work accomplished, was disbanded, for domestic art had become a part of instruction in educational institutions throughout the country.

In the West the movement began in the state institutions, Illinois, Iowa, and Kansas being the pioneers. Iowa seems to have been the earliest in domestic science, for at its opening in 1869 the young women students were required to work each day in the dining room and kitchen. Kansas Agricultural College reports the teaching of sewing as early as 1873–1874. In 1875–1876 lectures on food were given in the department of chemistry and a kitchen was fitted up in 1877. Women were admitted to the Illinois Industrial University (the State University) in 1870. The catalogue of 1871–1872 announced a School of Domestic Science and Art. In 1874 an instructor was appointed for this work. In 1875–1876 a well-organized course was printed in the catalogue.

Present Status. — According to compilations made by the United States Bureau of Education in 1909 and 1910 sewing and cooking are taught in 95 elementary school systems; 207 high schools; and 142 higher institutions.

The most complete list is published by the *American Journal of Home Economics*, 1911, as follows: (*a*) Collegiate Institutions receiving aid from the Federal Government, 32; (*b*) Collegiate Institutions not receiving aid from the Federal Government, 102; (*c*) Normal Schools, 102; (*d*) Secondary Schools receiving State Aid for Agriculture and Domestic Science, 64; (*e*) High Schools giving courses in Home Economics, 632. Special Institutions: (*a*) Schools of Domestic Science and Arts, 12; (*b*) Industrial Schools, 24; (*c*) Institutions for Defectives and Dependents, 26; (*d*) Part-time Schools, 26; (*e*) Institutions for Negroes receiving aid from the Federal Government, 17; (*f*) Institutions for negroes not receiving aid from the Federal Government, 69; (*g*) Institutions for Indians, 137. Total, 1243.

State Universities. — (The statistics quoted are taken from the *Organization List of Colleges and Experiment Stations*, 1900–1905; see Bevier and Usher, *The Home Economic Movement.* Those of later date were obtained through correspondence.) Arizona, 1900; Florida (State College for Women), 1906; Idaho, 1897 (dropped in 1899; two years' course added in 1903); Illinois, 1900; Indiana (Purdue), 1905; Kansas, 1910; Maine, 1909; Minnesota, 1900 (work for a degree, 1903); Missouri, 1901 (dropped in 1904; reorganized, 1906); Nebraska, 1898; Nevada, 1901; New York (Cornell), 1908; Ohio, 1896; Pennsylvania (State College), 1907; Tennessee, 1903; Utah, 1901; Vermont, 1908; Washington, 1909; West Virginia, 1899; Wisconsin, 1903; Wyoming, 1907.

State Agricultural Colleges. — A list of agricultural and mechanical colleges in the United States, published by the United States Department of Agriculture, Jan. 1, 1910, mentions sixty-seven institutions. Of these forty-seven are stated as having courses in Home Economics. Two more offer courses in Dressmaking. Of the forty-seven, thirteen are connected with state universities and appear in the list of those institutions in the preceding paragraph. This leaves thirty-four state institutions which offer such courses.

Private Colleges. — Well-organized courses are now offered in many of the endowed colleges and technical schools of the middle west. The work in the South has developed well in the normal and industrial colleges. In the East, Brown University has included work in home economics since 1903 in the Woman's College. Simmons College, Boston, incorporated in 1899, opened in 1902, to aid young women to self-support, numbers the School of Household Economics among its four schools. The Women's colleges of the East, Bryn Mawr, Mt. Holyoke, Smith, Vassar, and Wellesley, do not offer it, although they give courses in applied science, economics, and sociology that would be included in the home economics subjects in those colleges where such departments exist. Vassar, for instance, offers a course in household sanitation and in the chemistry of foods; Bryn Mawr a course in methods of social research, and a graduate course in problems of nutrition (1909–1910).

In the colleges and universities most of the courses offered count for the degree of B.S. Graduate work leading to the M.A. is also offered. In the University of Chicago the home economics course counts for either A.B., B.S., or Ph.B. The subject counts for college entrance to a very limited extent. Chicago and Illinois give two points credit each. At the University of California domestic science under certain conditions counts from one and one half to six units.

In 1907 the North Central Association of Colleges and Secondary Schools accepted household arts and sciences under the manual training group, the subjects to count as follows: plain sewing, one unit; sewing and millinery, one unit; cooking, two units. The revised Regent's Syllabus for the state of New York, 1910, includes syllabi of sewing and textiles and foods, which may prove a step toward the counting of the subject for college entrance. A number of committees are at work on this subject, but progress is of necessity slow.

Secondary Schools. — The growth of the work in the high schools was at first somewhat slow, but with the opening of the manual training high schools in different parts of the country, the number of schools giving household arts increased notably. Among these were the manual training high schools, Saginaw, Mich., Los Angeles, Cal., Providence, R.I. The establishment of the technical and vocational high schools has more recently added many to the list of high schools, as, for instance, the technical high schools of Cleveland and Cincinnati, Ohio, Newtonville and Springfield, Mass., the Cosmopolitan High Schools of Toledo, the Washington Irving School of New York City, and the William Penn of Philadelphia. Others to be noted are the Practical Arts High Schools of Boston, and New Bedford, Mass. Other cities are following the lead of these schools and in a few years every city will have its high school of practical training in which household art has an important part. Night schools in all of the large cities also offer technical courses of high school grade, which aim to affect the art of everyday living and the organization and management of the home. For fuller discussion of this movement, see Industrial Education.

Special Institutions. — Notable among the schools that may be classed as philanthropic are the schools or classes connected with the Young Women's Christian Association throughout the country. In larger cities there are well-developed departments which are also beginning training for domestic service.

Courses in the household arts are now given in a number of summer schools. One of the pioneers in this field was the Chautauqua Summer School, where demonstration lessons in cookery were given as early as 1879. In 1900 well-organized courses were offered, the work now covering a period of six weeks. The American School of Home Economics is a correspondence school of good standing having its headquarters in Chicago. This school has been valuable not only to housekeepers, but its publications of twelve volumes has been helpful in school work. The Lake Placid Conference of Home Economics, founded by Mr. and Mrs. Melville Dewey in 1899, has developed into the American Association of Home Economics, organized in Dec., 1909, with a magazine, the *American Journal of Home Economics.* Various branches of this Association exist in different parts of the country. The subject, too, is discussed in other associations of teachers and is becoming a prominent feature in the farmers' institutes and granges. New York City organized the Manhattan Trade School for Girls in 1902 and Boston followed in 1904 in the Boston Trade School. Both were at first under private control but were later taken over by the Board of Education. These schools attempt to reproduce trade conditions in their instruction; consequently they are organized as small factories. To aid the trades and to develop a higher class of work, art, and academic courses adapted to the specific needs of each of the trades represented in the schools are given. Wholesale and custom work are taken in all departments. A system of business shops headed by trade workers who can teach as well as conduct workrooms gives the students real business organization under which to work. The results in both schools show that such practical instruction enables the workers to enter better positions, to gain higher wages, and to continue to rise to more influential situations.

Training of Teachers. — The training of teachers of domestic arts for elementary and secondary schools now finds a place in many normal and in many university schools of education. The training for trade school teachers is not at present as well organized as in Europe but has been begun at Simmons College, Boston, and at Teachers College, Columbia University.

The formal training of teachers was begun in the Boston Cooking School, the Boston Normal School of Cookery, the New York College for the Training of Teachers, Pratt Institute, and Drexel Institute. From these centers, and from the Kansas Agricultural College, teachers were supplied for the new work all over the country. A one-year full time normal course was offered by the Teachers College in 1890, the course leading to a diploma. Up to this time a three-months' course with a certificate was all that had been offered by this institution. At the present time the University of Chicago and Columbia University train teachers of the household arts; the former in the School of Education, the latter in Teachers College. Several of the state universities and agricultural colleges afford such opportunity. Pratt and Drexel Institutes continue their normal departments. Of 147 public normal schools in 1910, 103 schools offered one or more branches of household arts. Of the 42 institutions listed in the Lake Placid *Report* as training teachers (1907) only seven were state normal schools or colleges. The demand for household arts in the state normals is on the increase, however. This is due probably to the awakening in regard to rural schools and the quickening interest in household arts teaching.

Training for Professional Service. — The training in America for higher professional teaching is helping to develop still other vocational positions for women. Leaders of culture, artistic knowledge, executive ability, social and industrial intelligence and business knowledge, are needed for such positions as institutional directors, managers of settlements, welfare workers, social secretaries, costume designers, interior decorators and craft workers. There is also an evident inclination to consider that highly educated and trained women can be successful as heads of large business houses for dressmaking, millinery, and embroidery, or for foreign buyers. These demands may lead to the offering of degrees for women corresponding to those in the engineering courses for men.

Domestic art has become an important factor in the medical profession and is used increasingly in work for epileptics, insane, and feebleminded. Orthopedic hospitals, insane asylums, blind asylums, orphanages, workhouses, and reformatories find in it a valuable subject which while offering practical help also has an ethical and hygienic bearing. Settlements, churches, and social clubs are also using the various subjects to help them in their work of betterment and in fostering a wise enjoyment of life. M. S. W. and H. K.

Great Britain and Ireland. — References to the importance of attention to domestic economy in the education of well-to-do girls are found in the writings of Hannah More, Erasmus Darwin, and other educationalists in the eighteenth century. In 1840 needlework was " expected " in national schools for girls and infants; it became compulsory in 1862. In 1846 also the Privy Council Committee on Education considered the propriety of granting a gratuity to schoolmistresses who taught domestic economy successfully in these schools, the reports of various Royal Commissions having drawn attention to the appalling home conditions of the laboring classes. School kitchens and washhouses were equipped in certain " industrial " schools, and during the next fifteen years frequent reference is made to the instruction of the female apprentices (pupil teachers) in "domestic industry." The Privy Council concluded, however, in 1860, that as school laundries and kitchens were "expensive to establish, expensive to maintain and difficult to conduct," they would no longer "press for them," but directed that attention be concentrated upon needlework. Henceforward until 1875, domestic economy was taught sparsely and by theory only. In that year practical instruction in cookery under trained teachers was " recognized " by the Board of Education, and in 1878 the plan of cookery " centers " was started for primary schools; government grants for such classes in day and evening schools were first made in 1882–1883. A few years later experimental classes in school laundry work were held in London under a joint and most representative committee; but the subject was not admitted into the code until 1889–1890. Eight years later " practical housewifery " was officially " recognized " by the Board of Education. Another ten years, and domestic science was introduced: viz. the experimental study of definite problems in hygiene and domestic economy. All these terms were superseded in 1905 by that of "domestic subjects " (cookery, laundry work, household management, dairy work, needlework, elementary dressmaking). At this date the curriculum was recast and household subjects were definitely regarded as a part of the program in all public elementary schools, including special schools for mentally and physically defective children. A circular was issued in 1911, and the new term, "housecraft," was introduced. Domestic classes for adults, directly designed to improve the conditions of home life, were established all over the country in 1890, as a result of the money made available through the Technical Instruction Act of 1889. These stimulated the provision by numerous private schools of courses, residential and otherwise.

Women inspectors of domestic subjects were appointed by the government in 1889. The official recognition of domestic subjects in secondary schools is relatively recent (1906); admirable courses are now becoming general, in which laboratory and art work are correlated with the practical domestic arts. Post-school courses increase in popularity, while the example set (1908) by King's College for Women (University of London), in its post and under-graduate courses in household economics, is soon to be followed by other universities. Scholarships for the residential housewifery centers and trade school courses for girls on leaving the primary schools indicate other lines of progress in large cities. Boys are taught cookery in the seaports of three counties. The provision of instruction for girls over eleven in primary schools remains quite inadequate, though in 1909–1910 instruction in cookery was given to 316,233 pupils; in laundry work to 118,040, and in combined domestic subjects to 6707. Needlework remains obligatory for all girls, but is now discouraged in infants' schools.

The revival of interest in 1875 was due to the lectures on the art of cooking given by Mr. Buckmaster at the International Exhibition, London, 1873; 1874 saw the foundation of the National Training School of Cookery, the first of these "recognized" by the Board of Education for the training of teachers, as well as for the instruction of the public. Though some of these schools are now under the management of public education authorities, they were all founded by private effort. Their union for examination purposes dates from 1876; it developed in 1889 into the influential National Union for the Technical Education of Women in the Domestic Sciences, to whose persistent efforts much progress is due. So great was the demand for teachers that many more training schools were opened in the nineties (thirty were "recognized" in 1897), when new subjects were added. Each training school issues its own diploma in cookery, laundry, housewifery, needlework, and dressmaking, under specially defined conditions; the requirements in general education and special training are being steadily raised, in spite of financial difficulties which have crippled their efforts. None but trained teachers have ever been sanctioned; their Association, with a membership of 1100, was founded in 1896.

Wales. — In the Welsh primary schools domestic art classes are on much the same lines as those in England. Twenty-nine out of thirty-three local authorities made provision for 90,000 girls from these schools (1907–1908). The first training school for the domestic arts was established at Cardiff, 1892. Cookery and laundry work are now taught in most of the girls' secondary schools in Wales, and a new three years' home-making course (four hours a week) appears in the program of the "mixed" higher elementary schools at Glamorganshire. This county has by its enterprise in the initiation of new developments in these subjects exercised great influence for good on adjoining local educational authorities. These include a wider (*e.g.* carpentering, care of children) and reorganized curriculum; a greater emphasis on the scientific and educational aspects of the domestic arts, with no loss of the practical spirit; a more consistent and closer connection with general education and home life. Special rooms to facilitate these methods are a feature in new schools. A short course is now offered to students at the University College of North Wales.

Scotland. — Needlework is obligatory in girls' primary schools in Scotland; otherwise cookery, of which the organization now corresponds generally with that in England, is the only domestic subject taught. At first (1884) demonstration classes were frequently given to a hundred pupils, though practive was always limited to twenty-four. Peculiar to Scotland are the "supplementary classes," entered, after a qualifying examination, by girls over twelve, from the primary schools. Nine hours a week for from two to three years are devoted to domestic science, while the general education is also proceeding. There are twenty-six such supplementary centers in Glasgow alone, with an attendance of over 2000 girls. The first Training School for Cookery was founded in the early eighties in Edinburgh, as a result of Mr. Buckmaster's lectures; though official efforts to give a more practical character to the examination in domestic economy of female candidates for the teaching profession date from 1859. No recognition is yet accorded to the domestic arts in the secondary schools for girls in Scotland.

Ireland. — No decided interest in domestic subjects was taken in Ireland before 1886. The City of Dublin Technical School organized classes in cookery, dressmaking, and laundry (the latter unsuccessfully) in 1887. The Dublin School of Cookery, Laundrywork, and Dressmaking, which owes its initiation to the Royal Irish Association for Promoting the Training and Employment of Women, in connection with the Association for the Technical Training of Women and the enthusiasm of private individuals, dates from 1893. It was taken over in 1903 by the Department of Agriculture and Technical Instruction, with the object of training teachers, though short courses are given to women of all classes. It is now described as the Irish Training School of Domestic Economy, and considerable attention is given to the sciences fundamental to the arts of cooking and cleaning. A residence house was opened in 1909, where students undergo a period of preliminary practical instruction, before the two-years' course for teachers. A special one-year course in housecraft was organized in 1910 at Alexandra College, Dublin. Three residential schools for well-educated girls were established at the Ursuline convents at Waterford, 1904, and Sligo, 1908, and in Londonderry, 1908, under the management of Victoria College. Eight corresponding residential schools for working class girls are scattered over the country. Domestic subjects are also taught (1909) in sixteen municipal and thirty-seven technical schools in Ireland. Courses in every branch of domestic economy, which admirably combine the practical with the educational, have been carried on since 1901 in fifty-eight girls' secondary schools, under the Department of Agriculture and Technical Instruction. They are described respectively as "auxiliary" (two years) or "special" (four years), and are obligatory on all pupils. Needlework has always entered into the primary school program. Cookery, laundry, and hygiene classes were introduced in 1896.

Denmark. — A few advanced educationalists advocated the introduction of domestic economy into primary schools between 1870 and 1880; but needlework and hygiene only were taught. The first school for the training of servants was started in 1872 by the Crown Princess Louise, and has remained the most important among its successors. In the nineties several housewifery schools were started by private individuals at Copenhagen and in a few provincial towns; of these some are residential courses, two to nine months. All have very moderate fees. A tentative plan for introducing cookery and laundry work into the primary schools of Copenhagen was adopted in 1893, but it was 1898 before voluntary classes were opened for the elder girls. Continuation classes were organized for workers from fourteen to twenty years of age at the same date.

The domestic arts are now compulsory (four hours a week) in the primary schools of Copenhagen and Frederiksberg, for girls in Class VII, age twelve to fourteen years, and in a very few provincial towns; nowhere in the country. Copenhagen and Frederiksberg have twenty-three centers — provincial towns twelve. These subjects are taught in eight secondary schools in Copenhagen and at seven in the provinces. Peripatetic teachers are employed in rural districts by various associations of women. Sixty to one hundred and sixty hours of instruction are given to women and girls for a nominal fee. Little provision is made for the technical training of girls in Denmark, though the State subsidizes a school for professional dressmakers in Copenhagen and another for seamstresses. University courses on the allied subjects of hygiene, chemistry, biology, etc., are accessible to women; and a state grant for further experimental work in domestic science was voted in 1905 to Fru Berg Nielson, one of the earliest advocates of housewifery teaching in schools. Practical demonstration courses in dietetic cooking have been also organized at the university for young medical men.

Sweden. — A school of household training for girls was opened by a committee of ladies at Gothenburg in 1865. The first of a series of schools for servants was started in 1870 at Stockholm by Froken Hedda Cronius, to which shops were attached for the sale of cooked provisions; but the first cooking classes in Sweden date from 1882 and are due to Fru Hierta Retzius, whose name will be always honored in connection with the great work she pioneered in that country. The school was self-supporting in two years. It was presented by its founder in 1893 to the Higher Training College for Women Teachers, with the sanction of the government, to secure trained teachers in secondary schools for girls; with the result that in 1908 twenty-eight out of thirty-seven such schools were eligible for the government grant in this subject. The instruction is carefully correlated with lessons in natural science, hygiene, bookkeeping, etc. Courses last one to three years, with one lesson a week. The State subsidizes four other training colleges for teachers in primary schools in towns and one for those in rural districts, the courses last about eight to twelve months; fees vary, but are all low. A union of Swedish teachers was formed in 1906. A bill was passed in that year making an annual government grant of 60,000 kr., to promote this instruction in primary schools, higher primary schools, and people's high schools. No fees are permitted; classes are limited to twenty; the bare cost of the food is charged for the dinners, etc. School courses usually cover two terms — four hours a day — one day a week. Boys learn cooking in some of the seaport towns and in one agricultural school; they also help the girls in the kitchens of the twenty "children's workshops," organized in Stockholm. Forty peripatetic courses are at work in twenty-one of the Swedish provinces, giving from five to seven courses of six weeks' duration each year to from fifteen to twenty pupils at each course. A large number of private *écoles de fiancées*, with very complete courses, also exist in Sweden. Courses are provided for work girls in some factories. The rapid development of this teaching in Sweden is sometimes attributed to the admission of women to the administration councils of schools.

Norway. — Great efforts to improve the education and general conditions of the people were made after 1814. Public opinion was educated by means of books and of a journal, concerned with the need for greater efficiency in daily life, which appeared 1860–1870, under the auspices of the Society for Promoting Popular Education. Fru Mina Weltesen founded the first school for domestic training at Abildsö, near Christiania, in 1865, and carried it on successfully for sixteen years. The movement grew rapidly after the establishment of the first school kitchens at Christiania in 1889. Now cookery courses are given in the primary schools of every town. The system is a combination of the English and German. Instruction is closely correlated with science work. Housekeeping appeared in the program of girls' secondary schools in 1896, and is now a subject for examination at the age of fifteen to sixteen. Needlework is compulsory in all schools. Trained teachers were employed from the first in all state schools; special short courses being arranged for ordinary staff teachers. Two years' courses in housekeeping were introduced into training colleges in 1902, and the government grants include traveling scholarships for selected students. Chemistry and physiology must be studied at a university, and the domestic arts at a training school of domestic economy. General pedagogical training is also insisted upon, in order to utilize the educative value of these practical subjects, to permit of correlation, and to dignify it in the popular estimation. Excellent private housekeeping schools have been organized in different towns by private individuals or by societies, such as the Society for Furthering the Interests of Women. Some of these are self-supporting; others receive grants from the government, municipalities, benevolent societies, etc. They are largely frequented by young ladies. Courses adapted to the needs of working women are also provided. Free instruction is provided for one third of the pupils in the provincial residential housekeeping schools, with a nine to ten months' course. The province defrays one quarter total expense; government defrays three quarters. The subjects of instruction are cookery, garden, laundry, dairy, needlework, chemistry, physics, biology, hygiene, etc. Short peripatetic courses of cookery and household management given by trained teachers are organized in some country districts by the Agricultural Society. Residential schools for the training of girls as domestic servants exist in Bergen and Christiania, with a two years' course. Cookery courses have also been carried on for soldiers since 1900, while the first school for the training of ships' cooks and stewards dates from 1893.

Finland. — The movement was distinctly educational from the first, and well supported by trained teachers, many of whom took the course in *Ménagère Pédagogique* provided by the people's high schools; others being trained for shorter or longer periods at the training schools now available for the purpose. The interest of the Association of Finnish Women was first aroused in the subject in 1889, when the organization of training upon educational lines was determined upon. Subscriptions sufficed to send Mlle. Anna Olsoni (Mdme. Quist) to study the subject in Sweden and Great Britain. After taking her diploma at Glasgow in 1890, she returned, and in 1891 became superintendent of the Helsingfors School of Training in Housewifery, at first supported by private subscriptions, the pioneer of many successors at, *e.g.*, Kripio, Tannefors, and Niborg. Courses were and are offered to teachers (for whom employment in schools of different grades is subsequently insured); for girls on leaving school; for young peasants; and in high class cookery for ladies. In 1907 this society organized no less than twenty-three peripatetic courses, with 293 pupils, from fifteen to forty years of age. The fees, five to fifteen francs, are supplemented by grants from the State. In 1892 a great impetus was given to the movement by the formation of a new union between men and women to work, in concert with the Martha Society, for the advancement of women's education, with the assistance of grants from the State (3000 francs per annum). Courses, varying in length from four days to six weeks, have been organized by forty of its branches all over the country, and a residential school for twelve pupils has been opened at Kolaris in Lapland. Cooking is not generally taught in elementary schools, though the instruction of girls has always included needlework and knitting, to which the use of the sewing machine is now added. Ample provision for its acquirement is provided in higher grade schools or by means of classes for adults.

Russia. — The first cookery school in Russia was opened in 1880 by the Society for the Protection of Public Health in St. Petersburg. In 1888 a technical school for girls and women was founded, which has now over 200 pupils. In 1890 a second cookery school was founded in Moscow by the Society for Propagating Practical Knowledge among Educated Women, from which eight professional schools have sprung. It supplies matrons for asylums, hospitals, etc. Four years later the Society for Encouraging the Professional Training of Women opened a similar school in St. Petersburg. Over 1200 students gained appointments in the first six years. Large numbers of scholarships are given by private individuals and societies of importance.

The teaching in the Russian training schools is of three types, and generally is associated with training in agriculture: (1) courses in St. Petersburg for the higher study of these arts, designed for girls who have completed their secondary school course, to prepare them for independent work in agriculture and farming (1907, 255 students). (2) So-called "Stebut courses," from the name of their originator, of which there are three near Moscow and Skov, designed for girls from higher elementary schools; these give both theoretical and practical instruction in both branches of knowledge (1907, 120 pupils). (3) Schools of a more technical character, of which there are twenty-one dispersed over the country under the Department of Agriculture, which give very full and thorough courses of two to three or four years, mostly free for the farmer class. All these schools are subsidized by the government to a total sum of 36,000 roubles. There are also a few similar schools under the Ministry of Public Instruction. Schools of cookery exist at Kiev, Odessa, Tiflis, and other large towns. So far the subject is not taught in the public schools, but it is required in institutions for orphan girls of noble birth.

Holland. — Great attention is given in Holland to the training courses for teachers and others. These are comprehensive, and include physics, chemistry, physiology, hygiene, bookkeeping and laundry work; as well as cookery and dietetics. Diplomas are granted after examination by the Union of Teachers of Household Arts (founded in 1900), which is subsidized by the Dutch government. This union organizes vacation courses for its members by specialists; possesses an excellent library, publishes an annual report upon the teaching of housewifery in Holland, and is associated with a Bureau of Women's Employments. The Departments for Army and Navy require that a proportion of soldiers and sailors shall attend cooking courses, specially adapted to their requirements, while other courses are arranged for recruits to the colonial army. Members of the Association of Nurses and Sisters of Charity have their special courses also. The new Housewifery School at Amsterdam has further organized successful courses in dietetics for doctors and medical students, the lectures on biological chemistry and invalid diet being given by university professors and supplemented by practical work under the supervision of the school staff. There is a municipal school for training domestic servants at Amsterdam, as well as corresponding courses at the Hague and elsewhere; these last being due to private initiative. Twenty-one housewifery schools have been founded since 1888, which are kept in close touch by their monthly journal. Nine prepare girls for examination in handicrafts, domestic and otherwise, accounts, bookkeeping, cutting-out, dressmaking, and the care of children. The remainder grant diplomas of various grades, professional or otherwise, in housewifery and cooking only. The majority of these schools receive grants from the State, the province, and the city, where they are situated. The numerous classes for working girls and women owe their origin and spread to various societies concerned with the public welfare, as well as private individuals; and to these sources is due the provision for the training of philanthropic workers. School instruction in practical cookery and laundry work is, so far, confined to a few primary schools in Leyden, the Hague, and Amsterdam; but twelve of the chief cities offer useful courses on leaving schools to girls who have gained their certificates, and the training schools provide evening classes and others for the general public.

Belgium. — The first administrative measures to promote the teaching of needlework in schools were taken in 1874, though the subject only became compulsory in 1879. Technical training for women, designed to relieve the poverty and unemployment brought about by industrial changes, originated in 1844, and cookery classes for their work-people were organized from 1871 onward by one large firm after another; but the ample provision for training in the domestic arts by which Belgium is distinguished, is the direct outcome of a grave social crisis — the strike of 1886 — to which the inefficiency of housewives was believed to be a contributory cause. Organized instruction, broadly speaking, dates from the year 1887. Public institutions for the necessary instruction of adults were soon opened by wealthy governors of provinces or societies, and after the experimental stages were passed received grants from the State, which subsequently imposed its own regulations (1889). Great elasticity is permitted to meet local needs, and every effort is made to fix hours convenient to young workwomen. A complete course usually extends over two years. These classes are considered the continuation and rational completion of the primary school course. Great impetus was given to this movement in primary schools by the central and provincial committees of influential women instituted for the purpose by the Royal Decree in 1880; it spread in 1881 to fifty secondary schools for girls, where three years' courses, essentially experimental and practical, now lead up to a diploma of capacity (instituted 1893), granted upon a syllabus and examination defined by the State. At the same time provision was made for the training of the necessary teachers at Brussels and elsewhere; at first by short temporary and holiday courses, until time permitted their more complete preparation. Hygiene, domestic economy, and needlework are taught in three out of the four years spent at a training college, by inductive, experimental, and practical methods. All instruction is under the direction of the Ministère de l'Intérieur et de l'Instruction, or of the Ministère de l'Agriculture, de l'Industrie et des Travaux Publics, according to whether it deals with adults or pupils still at school. The courses in housewifery are usually brief, limited, and theoretical, for the State does not advocate teaching the practice of these arts at this stage. Inspectors find that adults profit from the teaching far more than do children, though the system of instruction at centers is being introduced at Brussels, Bruges, etc., and is developing in connection with the *cantines scolaires.* Admirably organized work is carried on by the *écoles professionelles et ménagères*, which provide courses of from two to three years, and the *écoles ménagères*, which have courses of from one to two years, for girls from fourteen and upwards of varied capacity and social standing — chiefly lower middle class. About 300 of these schools existed in 1901, and their number is reported to have largely increased, while their pupils number many thousands. In each *école professionelle* (trade school), domestic economy and gymnastics must be taken in the general course; but in the other two types of schools mentioned, one half or the whole time respectively is devoted to every branch of the domestic arts. Grants are given for outfit; and an annual subsidy of two fifths the expenditure is made to those schools which fulfill state requirements. These trade, agriculture, or domestic schools may be under private or municipal control. Many bursaries are given, and fees vary widely, according to the means of the pupils. No peripatetic teachers or ambulatory schools are permitted in Belgium.

Germany.— In 1792 Hippel, the friend and disciple of Kant, when advocating the higher education of women, drew attention to the need for special training in domestic methods, on account of their influence on human well-being; but the first efforts made, a century ago, to arouse interest in the subject, resulted chiefly in the establishment of schools for training servants, of which many were founded between 1815 and 1875. In Germany, the movement is the outcome of private initiative, and is warmly supported by Women's Societies, large employers of women's labor, etc. These societies, of which the *Lette Verein* at Berlin was the first, sprang into life between 1850 and 1860, though it was 1873 before the Grand Duchess Louise of Baden, with the support of the Women's Association, founded the first housewifery school at Carlsruhe, cookery classes for adults were started in Berlin in 1885, at the instigation of the Crown Princess of Prussia, who, also, in 1888, secured some housewifery instruction for working girls. Fräulein Foester pioneered the first cookery classes in a girls' primary school in 1889. Munich, Nuremberg, and Augsburg followed the example of Cassel, and added an optional eighth class, devoted chiefly to a very complete course in housewifery, which is closely correlated with general education — no special teacher being employed. Thus organized instruction in domestic subjects came into being relatively late, though great strides have been made in the last twenty years; witness the *Official Code for Higher Girls' Schools in Prussia*, 1908, which requires that at least one year's training be given to each girl in housecraft, the rearing of children, and kindred subjects.

So great a variety of agencies are now engaged in the promotion of this instruction, that, in the absence of imperial reports and statistics, it is difficult accurately to describe their work. Sewing schools of a high standard were the first technical schools for women to get a firm footing in Germany; needlework is taught in every grade of school, classes being provided also for adults. The state and municipalities have only quite recently founded technical or industrial schools for girls, such as are found in Berlin, Leipzig, Dresden, Munich, Stuttgart, etc. They owe their existence to private enterprise, and have, unfortunately, no common standard. The *Fortbildungsschulen*, which now cover the country, and the *Fachschulen* (see INDUSTRIAL EDUCATION) include domestic art courses for teachers as well as pupils. Many teachers are trained locally, or in Berlin at the Lette Haus and the Pestalozzi-Froebel Haus (*q.v.*). Since no national regulations exist for this purpose, great diversity of requirements are found. State grants are made chiefly by the Departments of Commerce and Agriculture. The former founded model state housewifery schools at Rheudt, Potsdam, and Posen, 1902. Great opposition exists to making these subjects compulsory in primary schools, but many private societies endeavor to supplement the omission. When given, school authorities are responsible for all the arrangements made. The chief distinctive characteristic of Germany is the large development of residential homemaking schools (those of the *Diakonienverein* give all lessons in relation to the practical needs of life). They are frequented by middle-class girls, who pay good fees for one and a half year courses. Reference must be also made to the Society for Country Housewifery Schools (1897), founded by Frau von Kortzfleisch and assisted by the Minister of Agriculture; also of the traveling cooking schools for rural districts, now at work in Baden, Bavaria, the Palatinate, Lower Franconia, and the Rhine provinces.

Switzerland. — The most striking features are the rapid spread of such instruction, which is taught entirely as an applied art, not as science, during the past ten years, and the accessibility of the classes. Courses are given in the primary schools of a few towns and communes, but are universal in *Fortbildungsschulen* (continuation schools), *Arbeitschulen* (trade schools), *Haushaltungsschulen* or *écoles ménagères* (housewifery schools) — resident and non-resident. Short courses are provided for factory and other workers, in urban and rural districts. A close alliance between private societies and governing authorities does much to forward the movement, which sprang, in 1881, from the desire of a group of private individuals to improve the teaching of needlework. This became obligatory in schools in 1878, and is now carried to great perfection in the trade schools at Zurich, Geneva, etc., which confine their training to needlecraft, housewifery, and commercial work. 1881 saw the foundation of the first of many succeeding *écoles ménagères*, by *La Société d'Utilité publique des Femmes*. There are many of these residential housekeeping schools offering courses from three months to one year; their fees vary, but are very low.

In 1895 the federal government decided to make grants to these and similar institutions, for training women in trades for the domestic arts, which from the first had received liberal subsidies from the cantonal and local authorities.

Trained teachers were drawn at first from Germany; now training schools exist at Berne, Zürich, Fribourg, Geneva, etc. No general syllabus is yet imposed. There is inspection by the federal inspectress, but a good deal of freedom is sanctioned. In Geneva girls must proceed, at the close of their sixth year in the primary school, either to a secondary school, where there are now optional courses in the domestic arts, or to an *école professionale et ménagère,* for at least two years, where one half of the time is given to these subjects. Other towns are imposing similar regulations. The training of servants continues at Berne, Fribourg, and Winterthur, but has not so far effected a solution of the domestic problem. Elaborate courses, domestic or professional, in every branch of needlework, are offered at a large number of special schools throughout the country; they vary in length from a few weeks to four years. Very few of these classes are free, as is constantly the case with those concerned with cookery only.

Austria and Hungary. — In the eighteenth century the Empress Maria Theresa (*q.v.*) issued a general ordinance, requiring that girls be taught the best methods of sewing, knitting, and domestic economy in every school; but a century elapsed before the two former were introduced into elementary education. The whole group of subjects was made obligatory in 1869, but the regulation as to housewifery remained a dead letter and was suppressed in 1833. Opportunities for instruction in cookery are still chiefly the result of private enterprise, though latterly some education authorities have recognized the movement. In Hungary, especially, this has occurred, and instruction is given to the girls in the *Repetition,* or higher grade schools. In Buda-Pest there are thirty-six such schools, numbering 4000 pupils. Cookery is also taught in the technical schools of that city, and in the normal colleges for women teachers, but nowhere yet in elementary schools, though, through the persevering efforts of private and educational societies, courses are in some instances provided in an annex to the schools, supported by fees and subscriptions. Austria and Hungary are chiefly responsible for (1) the schools for servants and others attached to restaurants for the sale of the food cooked, started in 1883 by the Society of Housewives, taught by expert but untrained teachers. In 1906 the Union of Hotel Keepers combined with the country housewifery schools to provide a one-year course of training for teachers, from which much stimulus is expected. (2) The local farm or housewifery schools, founded by agricultural societies in the various provinces, for the daughters of better-off peasants after leaving school. These include in their very practical curriculum the care of children and sick nursing. (3) The general provision by factory owners and philanthropists of free cooking classes for working girls (three months' courses, five evenings a week), which now number over 2000 — twelve pupils to a course. Untrained teachers are the great obstacle to progress, as well as the absence of state interest and aid. Both are probably due in part to the peculiar racial conditions and difficulties of the Empire. Official attention has been concentrated for years upon technical as well as school and normal college training in every branch of the finest needlework for women and girls. In the large and efficient trade schools and technical institutes scattered all over the Empire, general and special instruction is given in lace work, lingerie, dressmaking, millinery, embroidery, design, drawing, and painting.

France. — Needlework was recommended as a school subject in 1850, and made obligatory in 1882, when practical teaching of the domestic arts was officially, though not actually, introduced into primary and secondary schools; an *école de ménage* was instituted at Rheims in 1873, with a three years' course for girls on leaving school; similar *cours complémentaires* were organized more generally in 1884–1887. But the practical teaching of cookery and housewifery has been generally brief, restricted, and theoretical, attention being concentrated upon elaborate needlework. The movement to perfect girls in this art was begun in Paris in 1842; a society to cope with its rapid development was formed in 1856. Since 1886 these *écoles professionelles* have steadily grown in scope and importance. The mornings are devoted to general education, the afternoons to technical training in every branch of needlecraft, dressmaking and cutting, millinery, etc. There are eight such municipal technical schools (*écoles pratiques de commerce et d'industrie*) in Paris, with an average of 300 pupils each. Instruction is free, scholarships being granted for clothes and meals. In the *écoles professionelles ménagères* (technical schools), each pupil must have eight weeks' practical cooking, laundry work, and housewifery during her three years' course; but in part as the result of the relatively high level of cookery in France and the belief that such training should be given in the home, practical teaching in these arts is still far from widespread. The *Orders* of 1887–1888–1889 remained dead letters; but a great extension of the movement dates from 1897, when the establishment of a training school was required in every town of over 50,000 inhabitants, and *classes ménagères* became obligatory for girls over thirteen in every urban school numbering over 250 pupils. Considerable incentive was given by the conclusions on the subject formulated at the International Congress on Primary Education held in Paris, 1900. *Cours complémentaires manuels et ménagers* for girls holding certificates from the primary schools were established in 1901, which cover two years, with a weekly total of thirty-seven and a half hours; and a three years' course provided for girls up to sixteen or seventeen in the *écoles primaires supérieures*, in which needlework, dressmaking, millinery, and hygiene are included. Though students in the training colleges for primary teachers do their own housework, training is only given in needlework and dressmaking, two to three hours weekly for three years. In one or two cases in the *lycées de jeunes filles* (public secondary schools for girls) optional demonstration courses are offered, given by the cook of the establishment; they are attended chiefly by girls who have left school. In 1903 the University of Lyons offered a two years' course to women, six hours a week, on applied biology, bacteriology, the rôle of women in the family, hygiene, etc. The subject is slowly gaining recognition in the primary schools of Paris, chiefly in connection with the *cantines scolaires*, for which the elder girls prepare the food. No provision is made for the adequate training of teachers. Great credit is, however, due to the work of *La Ligue Patriotique des Françaises*, for the promotion of such teaching as does exist among women of all ranks in France.

Italy. — The state and municipal recognition and support now accorded to the domestic arts is due to the influence of Queen Margherita at the end of the nineteenth century, as well as to that of the venerable "apostle of training in the domestic arts," Signora Adèle Levi Della Vida. The parent institution of the numerous *scuole professionale* established at Rome, Turin, Venice, Milan, Florence, Naples, Parma, Bologna, Palermo, etc., for boys and girls of the working and artisan classes, was started by the municipality of Rome in 1876. The Minister of Public Instruction (Signor Boccelli) introduced manual instruction into the primary schools in 1889; the teaching of housewifery followed in 1904 and became obligatory in the *scuole professionale* in 1907. These schools aim, with every evidence of success, at the preservation of educational advantages, while stress is coincidentally laid on the acquisition of practical skill. Pupils are admitted, with a nominal entrance fee, at ten years of age, there to finish their elementary education and then to proceed to some special line of handicraft. All girls must learn drawing and cooking, while choice of three subjects must be made from needlework, lace, white embroidery, dressmaking, ironing, hairdressing, artificial flower making, geometrical and ornamental drawing and design, or bookkeeping, etc. The wages earned on leaving average double those of untrained girls. These schools are subsidized by the State and municipalities. Several schools for the training of matrons for factories exist in North Italy. Classes have been formed at Milan and other cities for the training of young girls of the working classes, while training for girls of the upper classes are provided at Rome in 1907. These private efforts receive state aid.

Australia. — Cookery has been taught in New South Wales since 1890; by 1905 both sewing and cooking had been introduced into the public schools. Centers to which children from neighboring schools are sent have been established throughout the State. The courses extend over one half year, with one meeting of an hour each week. The work is simple and practical, relating to duties of the home. Provision has been made for the training of teachers for the subject. In Victoria there are some twenty-five fully equipped centers for cookery throughout the State; the State is prepared to double any local expenditure for the erection of suitable kitchen and dining room. In Western Australia there is a similar system of centers attended by children from definitely assigned schools. The subjects taught are cookery, laundering, sewing, and housewifery. Perth is the first town in the commonwealth to establish housewifery and a complete cottage. Here cookery, laundering, care of sick, infants, and young children, besides house care and management, house furnishing, and decoration, marketing, and cleaning. In Queensland many branches of the subject are taught in the numerous technical colleges and in "branch classes" (extension) where no technical college exists.

South America. — The girls of the upper classes are taught mainly in convents, in which the domestic arts include sewing, embroidery, flower making, and lace making. In the Argentine Republic there are so-called "professional" schools in which domestic science and needlework are taught. At Buenos Aires three trade schools for girls are maintained, while there is also a commercial school for women. Girls from seven to thirteen in the primary grades of Brazil have needlework. Higher work is provided in manual training schools, normal colleges, polytechnic schools, and schools of arts and trades. At Montevideo, Uruguay, some branches of household arts are taught in the school of arts and trades.

Canada. — At present domestic science and art are taught in a great number of the large public school systems throughout the country, usually by peripatetic teachers. For advanced work provision is made in many agricultural colleges and special schools of household arts or science, the best known being the Macdonald Institute at Guelph, Ont., and the Macdonald College at Ste. Anne de Bellevue, Que. (See CANADA, EDUCATION IN.) A. R.

In general see the article on INDUSTRIAL EDUCATION.

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HOUSES, SCHOOL. — See ARCHITECTURE, SCHOOL.

HOUSTON COLLEGE, HOUSTON, TEX. — An institution for the education of colored men and women, established in 1845. Elementary, college preparatory, normal, industrial, and theological departments are maintained.

HOVEY, CHARLES EDWARD (1827-1897). — Normal school principal; graduated at Dartmouth College in 1852. He was principal of the High School at Framingham, Mass., 1852-1854; superintendent of the schools at Peoria, Ill., 1854-1857, and first principal of the Illinois State Normal School, 1857-1861. He was editor of the *Illinois Teacher,* 1856-1861. W. S. M.

HOW, SAMUEL BLANCHARD (1790-1868). — Sixth president of Dickinson College; was graduated from the University of Pennsylvania in 1810 and the Princeton Theological Seminary in 1813. He was president of Dickinson College from 1830 to 1832. He was the author of several works on religious education. W. S. M.

HOWARD COLLEGE, BIRMINGHAM, ALA. — An institution founded in 1842 under the auspices of the Alabama Baptist State Convention. Academic and collegiate departments are maintained. Ten units are required for entrance to the college, which grants the degrees of A.B. and A.M. There is a faculty of thirteen members.

HOWARD, JOHN. — See PENOLOGY, EDUCATIONAL ASPECTS OF.

HOWARD PAYNE COLLEGE, BROWNWOOD, TEX. — A coeducational institution under the control of the Baptist General Convention of Texas, founded in 1889. Preparatory, college, normal, business, music, expression, and art departments are maintained.

HOWARD UNIVERSITY, WASHINGTON, D.C. — A coeducational institution for all races. The university buildings, with the exception of the medical and law schools, stand on a campus of twenty acres. The institution maintains a college of arts and sciences, a teachers' college, a school of manual arts and applied sciences, an academy and commercial college, as well as the schools of law, medicine, and theology. The entrance requirements are fifteen units of work. The degree of A.B. is conferred on the completion of a college course or a four years' course in the teachers' college. The entrance requirements to the school of medicine are those of the Association of American Medical Colleges, and a four years' course is offered. The New Freedmen's Hospital affords clinical facilities to the medical college. The school of law which is situated in the city offers a three years' course, the requirements for which are a four years' high school course. There are 121 members on the faculty.

HOWE, SAMUEL GRIDLEY (1801–1876). — Founder of American institutions for the education of the blind; was born at Boston on Nov. 10, 1801. He was educated at the Boston Latin School and Brown University, graduating in 1821. Three years later he completed the course at the Harvard Medical School. He served for six years in the Greek war of liberation, and for a time gave his services to the cause of liberty in the ill-fated kingdom of Poland. At the suggestion of Dr. John D. Fisher he went to France in 1831 to study the methods of educating blind children, and in the following year he opened at South Boston the Perkins Institution and Massachusetts School for the Blind; and during the next forty-four years he trained the teachers and shaped the policy of practically all the schools for the blind in the United States. (See the article, BLIND, EDUCATION OF.) One of his notable triumphs was the education of Laura Bridgman (*q.v.*), a deaf-blind girl, and through her education the development of a system of touch training now widely used in the education of deaf-blind children. In 1846 he was chairman of a commission for the study of idiotic and feeble-minded persons, which resulted in the establishment of the Massachusetts School for Feeble-Minded Children. In coöperation with his wife, Julia Ward Howe, he founded the *Daily Commonwealth* in 1851. He originated the Massachusetts State Board of Charities and Corrections in 1863, — the first of its kind in the United States, — and was its first president. He was intimately associated with Horace Mann (*q.v.*), in the establishment of the Massachusetts common school system. He wrote numerous papers on the education of the blind and feeble-minded, several works on Greek modern history, and a number of textbooks for the use of the blind. W. S. M.

See BLIND, EDUCATION OF; DEAF-BLIND, EDUCATION OF THE.

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SANBORN, FRANK B. *Samuel G. Howe, the Philanthropist.* (New York, 1891.)

HOWELL, JAMES (1594?–1666). — Historiographer Royal of England (1661), and educationally of importance from his interest in advancing the study of foreign languages both by study in England and by his advocacy of travel abroad as a means of education. He is now best known by his letters from abroad. Howell was of a Welsh family, educated at Hereford Grammar School, whence he was entered at Jesus College, Oxford, and graduated B.A. in 1613. With foreign missions and secretaryships he lived until 1642, when he was appointed as clerk of the Council, an arrangement upset by the Civil War. He turned to writing for a livelihood, and, as Mr. Arber says, " he is one of the earliest instances of a literary man successfully maintaining himself with the fruits of his pen."

In his *Instructions for Forreine Travel* (1642) he claims to show " by what course and in what compass of time, one may take an exact survey of the kingdoms and states of Christendom, and arrive to the practical knowledge of the languages to good purpose." In this short treatise he points out the educational use of travel, " which may be not improperly called a moving academy, or the true Peripatetic School." More direct contributions of Howell to educational progress are to be found in the direction of linguistics. (1) He published a new edition of the French-English and English-French *Dictionary* of Randle Cotgrave (*q.v.*) in 1650, adding his " Animadversions." The book is addressed to nobles and gentry, and to merchant adventurers both English and the " Dutch here resident " for commercial purposes. (2) The Polyglot *Dictionary* of Howell marks the highest development, up to 1660, of polyglot dictionaries, from the point of view of the English people. The comprehensive nature of the work was intended to meet the needs of nobles and gentry, of commercial people and of scholars. Howell not only produced his modern languages lexicon, but did for adages or proverbs generally in England what Erasmus had done for classical adages in Europe. Still further, he brought his native Welsh language in line with other languages as worthy of knowledge and study by other nations. (3) Howell's Grammar. *A New English Grammar, Prescribing as certain Rules as the Language will bear, for Forreners to learn English: There is also another Grammar of the Spanish or Castilian Toung, with some special remarks upon the Portuguese Dialect etc. Whereunto is annexed Discours or a Dialog containing a Perambulation of Spain and Portugall, which may serve for a direction how to travell through both Countreys, etc. For the service of Her Majesty* (*i.e.* Queen Catharine of Braganza) *whom God Preserve.* 1662. This contains the English grammar on one page and the same rendered into Spanish on the other. Howell attempts " a grammar of English in itself," not an English grammar, " to learn another language as Lily for Latin and Littleton for French." (See HOLYBAND.) Accordingly (p. 83) Howell writes an account of *Divers superfluous letters in English Orthography*, and advocates phonetic spelling as much as possible, his maxim being *Frustra fit per plura quod fieri potest per pauciora.* F. W.

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Watson, Foster. *The Beginning of the Teaching of Modern Subjects in England.* (London, 1909.)

HOWLAND, GEORGE (1824–1892). — School superintendent; was educated in the public schools of Massachusetts and at Amherst College, graduating in 1850. He was tutor in Amherst from 1850 to 1853; instructor in the Chicago High School, 1858–1860; principal of the same from 1860 to 1880, and city superintendent of schools in Chicago from 1880 to 1892. His educational publications include *Practical Hints for Teachers of Public Schools* (1889), a grammar, several Latin texts, and numerous addresses on educational subjects. W. S. M.

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HRABANUS, MAURUS. — See Rabanus Maurus.

HROSWITHA. — See Roswitha; Women, Education of.

HUARTE NAVARRO, JUAN DE DIOS. — Physician, psychologist, and educationist; born at Saint-Jean-Pied-de-Port, in Navarre (Basse-Navarre) about 1536. Though French by birth, he was Spanish by training. Huarte's name lives on account of his book, in which the mental activity brought to bear on the greatest educational problems affords ground for naming it one of the most remarkable original works issued by the press in the sixteenth century (1575). This work was translated from an Italian version by Richard Carew (*q.v.*) in 1594, with the title: *Examen de Ingenios, The Examination of men's Wits. In which, by discouering the varietie of natures, is shewed for what profession each one is apt, and how far he shall profit therein. By John Huarte. Translated out of the Spanish tongue by Mr. Camillo Camilli. Englished out of his Italian, by R. C. Esquire.* Insisting on the essential differences in individual abilities, Huarte points out that it is thus necessary educationally to make an examination or trial of minds to see the diverse natures or "wits" and from such an inquiry to determine the special directions from which they are to find suitable nutriment in the material of knowledge.

Huarte suggests classification of pupils on the basis of temperament or of psychological characteristics, rather than on common possession of the same details or bulk of knowledge; and claiming the authority of Galen, Huarte would wish state officials to sound the wit and natural application of children so as to set each to learn the art most suitable to each, and "not leaving it to them to act of their own choice." There is much that may be regarded as antiquated about Huarte's views of temperament and the soul in its three aspects. But Huarte is certainly in accord with later educational writers in his emphasis on self-activity as the principle of the human soul, in his theory of the effect of climate on character, in his idea of heredity and the influence of dieting on temperament and thence on educational processes. Huarte also takes up questions of parentage, on the physical side, discussing the birth and prenatal conditions of "wit" in children.

Huarte has taken ideas from Plato, and still more from Aristotle. Yet his debt is greatest of all to Galen (see Dr. Guardia's *Essai*, p. 253). Huarte cites from classical authors and from the Scriptures in the manner of post-Renaissance writers. Dr. Guardia has given a full account of the critics of Huarte.

Besides Richard Carew's translation in 1594, another was undertaken in 1698 by Edward Bellamy, who describes the book as "useful for all Fathers, Masters, Tutors, etc." It will thus be seen that the suggestions of Huarte logically led to the advocacy of child study, and he deserves recognition as one of the most important of the pioneers of the subject.

Huarte was adversely criticized by Antonius Possevinus e Societate Jesu, *Cultura Ingeniorum . . . Examen Ingeniorum Io. Huartis expenditur* (which first appeared in Possevinus's, *Bibliotheca selecta de ratione studiorum*, Rome, 1593; and afterwards was separately published, *e.g.* 4th ed., Venice, 1604); and by Jourdain Guibelet (Docteur en Médecine), *Examen de l'Examen des Esprits* (Paris, 1631). F. W.

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HÜBNER, JOHANN (1668–1731). — German schoolmaster and author of textbooks in scripture, history, and geography. He graduated at Leipzig, and for a time lectured there; in 1690 he became rector of the gymnasium at Merseburg, and in 1711 rector of the Johanneum at Hamburg in succession to Fabricius (*q.v.*). His success, however, lay more in his textbooks, especially *Kurze Fragen aus der alten und neuen Geographie* and *Zweimal zwei und fünfzig auserlesene biblische Historien und Fragen* (1714). Both works were translated into many foreign languages, and the latter at any rate had a great vogue for many years. The biblical stories were short, and Hübner's method was to have pupils read them two or three times and then be ready to answer questions on the text. Hübner's book furnished the questions without answers. Hübner also issued a number of school atlases and maps. Just before his death he published *Die ganze Historie der Reformation in fünfzig kurze Reden nebst einem Schauspiele von Bekehrung der Sachsen zum Christentum* (*The complete history of the Reformation in fifty brief Addresses, with a Play on the Conversion of the Saxons to Christianity*, 1730).

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HUE. — This term refers to the specific qualitative difference between colors, which may, however, possess equal saturation (*q.v.*) and brightness (*q.v.*). The *hue* and the *tone* of a color are distinguished by reserving the latter term for monochromatic lights (see Color), while "hue" refers to mixed lights as well. Thus, red, yellow, blue, etc., are tones; scarlet, purple, crimson, etc., are hues. Buff and yellow, lilac and lavender, on the other hand, would not differ so much in hue as in saturation, or, to use the artist's terminology, in chroma.
R. P. A.

HUGH OF ST. VICTOR (1096–1144). — A twelfth-century scholastic theologian, philosopher and mystic; was born at Blankenburg in the Harz, and at an early age took the habit of the Canons Regular of St. Augustine at Hamerleve, near Halberstadt. There he received his early education. In 1115 he went to the house of his order, the celebrated monastery of St. Victor, near Paris, where the entrance seven years previously of William of Champeaux marked the foundation of the Victorine School of mysticism. From 1133 to his death in 1144, Hugh was head of the school. Besides works on general theological subjects and on sacramental theology which earned him the title of *Alter Augustinus*, he wrote a number of important treatises on mystical theology, namely, *De Arca Noe Mystica, De Arca Noe Morali, De Vanitate Mundi, De Arrha Animæ De Amore Sponsi ad Sponsam.* These are published in Migne's *Patrologia Latina*, Vols. CLXXV–CLXXVII.

As a mystic, Hugh did not go to the length of condemning all rational philosophy. On principle, he avoided the discussion of questions which, though they occupied almost exclusively the minds of his contemporaries, seemed to him to be futile. Such, for instance, was the question of Universals. He himself, especially in the work *Eruditionis Didascaliæ*, developed a system of philosophy in which he attached paramount importance to psychological introspection. But while he appreciated philosophy, he maintained that all rational knowledge must be supplemented, and in a sense superseded, by mystic contemplation. He taught that knowledge is not to be valued for its own sake, but as a means of attaining a contemplation of higher spiritual truths. In the treatise *De Contemplatione et ejus Speciebus* (pub. by Hauréau in 1859) he distinguishes three stages in the mystic life of the soul. The first is the preparatory stage, in which the soul by thought (*cogitatio*) seeks God in the material world; the second is the meditative stage, in which the soul by reflection (*meditatio*) seeks God in itself; the third is the contemplative stage, in which the soul by intuition (*contemplatio*) seeks God Himself. The faculties by which truth is perceived in these successive stages are called respectively "the eye of the flesh," "the eye of the intellect," "the eye of the contemplation." It was by means of this doctrine that Hugh exerted a very widespread influence among mystical writers and teachers all through the Middle Ages. W. T.

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HUGHES, JOHN (1797–1864). — Leader of the Roman Catholic movement for the division of the public school funds, and founder of St. John's College; was educated at Mount St. Mary's College, Md., and attained distinction as an ecclesiastic in the Roman Catholic Church. He founded St. John's College at Fordham (*q.v.*), and conducted the campaigns (which failed) during 1840–1842 in the municipal elections of New York City and the legislature of New York State for the admission of Roman Catholic schools to a participation in the common school funds. W. S. M.

See Parochial School System.

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HUGHES, THOMAS (1823–1896). — Author of *Tom Brown's School Days;* born at Uffington, Berks., and educated at Rugby and Oriel College, Oxford. At Rugby he came under the influence of Thomas Arnold (*q.v.*), of whom he has drawn such a reverent picture in the story of the school. By profession Hughes was a barrister, but his interests were mainly in the social questions of the day. He took up the cause of trades unionism, coöperation, and the relations between employers and workmen.

He was intimately associated with F. D. Maurice (*q.v.*), the Christian Socialist movement, and the Working Men's College in Great Ormond St., London. Here he conducted a Bible class, out of which came his work, *The Manliness of Christ* (1879). He was principal of the college from 1872 to 1883. His interest in social reform influenced him to enter politics, and from 1865 to 1874 he sat in the House of Commons. His admiration for Lowell prompted him to visit New York and Boston, where he was received with enthusiasm as the author of *Tom Brown's School Days* and as a sympathizer with the North during the Civil War. In America, too, at Rugby, Tenn., he established a colony on a coöperative basis, which, however, was financially a failure.

In addition to *Tom Brown's School Days*, which he wrote in 1853 and published anonymously in 1857, Hughes was the author of *Tom Brown at Oxford* (1861); *The Scouring of the White Horse* (1889); *Memoir of a Brother* (1873); *Vacation Rambles* (1895). But his fame will always rest on *Tom Brown's School Days*, which, more than any other work, spread far and wide the fame of Rugby, the reforms of Arnold, and the spirit of the public school. For some time it was thought that the prototype of Tom was Hughes himself or his elder brother, George, and that Arthur was Dean Stanley, but the author denied this strongly in the preface to *Tom Brown at Oxford.*

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HUGUENOTS IN EDUCATION, INFLUENCE OF. — See CALVINISTS AND EDUCATION; FRANCE, EDUCATION IN.

HULL HOUSE. — SEE SOCIAL SETTLEMENTS AND EDUCATION.

HUMANE EDUCATION. — This form of education is a product of the humane movement of the past century, which began in a distinctive way in England in 1822 with the passing by Parliament of the first law for the prevention of cruelty to animals and with the organization of the Royal Society for the Prevention of Cruelty to Animals. In the United States its beginning was marked by the organization of the American Society for the Prevention of Cruelty to Animals in 1866. The movement has since spread so rapidly that organized protection of animals against cruelty and neglect is now world-wide.

The term "humane education" might fittingly be applied to any effort aimed at the inculcating of humane ideals or the furthering of humane practices by precept or rule of action. Such effort would include at least three aspects: (*a*) the instruction of children along humane lines, (*b*) the educating of teamsters and others dealing with animals in best methods of care and treatment, (*c*) the forming and stimulating of public opinion — through press and pulpit, through special literature and through exhibitions — to a more humane attitude and practice. Only the first of these phases will be dealt with here.

The philosophy underlying humane education varies among its advocates. As a rule the basis is emotional rather than rationalistic. This basis finds its most consistent expression in the view of an equality of absolute rights on the part of all sentient creatures. It is regarded as a mistake to suppose that the rights of animals are in any way antagonistic to the rights of men. Animals, as well as men, in this view, have the right to live a natural life, to attain an individual development, subject to the limitations imposed by the permanent needs and interests of the community. And in determining what these permanent interests are, there should be equality of claim on the part of all orders of animal creation. This is a philosophy of individualism applied to all sentient life. Another view, that may properly be contrasted with this, would take into account the desires and pleasures of the inferior animals, but not from the standpoint of the positive rights of the animals themselves. Man's sovereignty over the animal kingdom is recognized, and the effects of man's acts upon human character and welfare is viewed as a dominant consideration. Rights are relative. The rule of nature is that the lower generally serves the ends of the higher. The question of suffering and destruction inflicted by the stronger upon the weaker should be made a subject of scientific study as well as of sentimental regard. In any scheme of humane instruction, the sympathy of the young is the motive that forms its cornerstone. With the philosopher of absolute rights the major aim is to arouse that sympathy by dwelling on cases of extreme cruelty and suffering, to reach a humane attitude by developing a keen appreciation of wrongful acts. The relativist, on the other hand, tends to lay stress on a knowledge of the structure, habits, and functions of animals. What ought to be done, rather than what ought not to be done, is emphasized; and a cardinal purpose is to teach that unnecessary and wanton injury or destruction of either plants or animals is uneconomical, injurious to society, and dangerous to the character of the offender. Actual instruction along humane lines, however, is ordinarily based on no well-reasoned philosophy of animal treatment. The mass of those associated with the anti-cruelty movement are not doctrinaire. They simply follow the opportunist policy of dealing with cruelties as they arise, and of mitigating severities of animal treatment as far as the prevailing situation will permit. Humane educational schemes usually share this opportunist quality.

Private Organization. — For the most part, humane education is carried on under private auspices. Humane workers have steadily emphasized the need of humane instruction in public schools, and some progress has been made in this direction; but the larger effort has been expended on instruction given in small groups, organized in any opportune way. Various titles are given to such groups. "Junior Humane Society" is sometimes applied; "Young Defenders" is the name used in the parent American anti-cruelty society; but "Band of Mercy" groups are much the most numerous, and their activities are typical of scope and method, by whatever name children's organizations of this sort may be known. The first Band of Mercy was established by Mrs. Caroline Smithies at Wood Green, England, in 1875. At her death the movement was continued by her husband and daughter; and later, in 1883, a union of all bands in the kingdom was formed, with the Royal Society for the Prevention of Cruelty to Animals at the head. Under the arrangement the Royal Society became the governing body for the union, but the bands retained their freedom of direction and responsibility in all local matters, including financial independence. Uniform cards of membership, members' badges, and registers were adopted by all bands. The governing body provided these at cost. A half-penny monthly journal, previously and since issued by the Royal Society, entitled *Band of Mercy*, became the organ of the union. The bands have multiplied in number. Their formation has been promoted in many directions, as separate and distinct organizations, or within Sunday or day schools, or in connection with Bands of Hope or other moral, social, or religious associations. The Royal Society has been particularly insistent that each band should have a formal organization and a permanent secretary. Members pay small dues. Regular meetings are held at which lectures or addresses are given, Band of Mercy melodies sung, readings and recitations delivered, stories and anecdotes related, and interesting or meritorious work done by members reported.

The pioneer in American Band of Mercy work was Mr. George T. Angell of Boston. He founded the American Humane Education Society, which has been instrumental in forming more than eighty thousand such bands in the United States. How many of these are active organizations it is impossible to say. To each band of thirty or more members the Society sends each month a copy of *Our Dumb Animals*, from which readings and recitations may be selected. *Twelve Lessons on Kindness to Animals*, published by the Society, badges, members' cards and other matter are likewise provided. Effort is made to have Band of Mercy Day observed in the public schools. In Massachusetts a day in April has been observed in this way for three years past, and in the schools of Boston for four years. In 1909 a pamphlet of thirty-two pages, the *Humane Manual*, was gratuitously distributed to the 15,000 teachers of the State. In 1908 a similar pamphlet containing a reprint of selections from the chapter on animals in Hyde's *Practical Ethics* was so distributed. This work is in the hands of the State Organizer of the Society.

An interesting experiment along these lines has been undertaken in New York by the American Museum of Natural History. A series of lectures dealing with animal life were planned to be given at the museum and at various settlement houses throughout the city. The lectures were used as a starting point for the formation of settlement bands of "Young Defenders," who are expected to protect street dogs and stray cats from molestation and to report cases of ill treatment to the anti-cruelty society. Another method of reaching children is that of instituting humane essay competitions in schools, to the winners of which suitable prizes are awarded. In Buffalo, for instance, more than 1500 such essays were received from pupils in the sixth, seventh, eighth, and ninth grades and high schools in the 1909 competition. In Rochester the Humane Society offers prizes to public, private, and parochial schools in a similar way.

Even in a hasty survey of private efforts for the humane education of children, it would be a mistake to leave the impression that its object ends with the attaining of a more kindly attitude toward dumb creation. Its material in the main deals with animals, and is calculated to further their humane treatment; but its aim — however quixotic and inspirational its methods — is the broader one of developing a more considerate attitude in every aspect of life.

State Provisions. — State legislation has done little to further humane education, beyond recognizing humane societies, Audubon societies, and other organizations as agencies for its promotion. A succession of New York laws provide for an agreement with the American Museum of Natural History in New York City, by the terms of which materials, specimens, etc., are provided for free instruction in natural history in normal and other schools for the preparation of teachers, and in free common schools. Further, lectures are provided for, to be given on holidays and at other suitable times to artisans, mechanics, and other citizens. In Illinois, California, and some other states the law provides for an annual "Bird Day" in the schools. The law of Colorado requires that two lessons per week (not less than ten minutes each) be given in the schools on the humane treatment of animals. The law of North Dakota prescribes a like period for "a system of study of the humane treatment of animals," as do the laws of South Dakota, Montana, and Wyoming. The latter three, however, specify "a system of humane treatment as embodied in the laws of the respective States, and do not prescribe a definite period of instruction. In California humane education is compulsory in all primary and grammar schools having more than one hundred census children in the district. This instruction may be oral, and the purchase of textbooks may not be required of pupils. In Oklahoma the law prescribes instruction in schools to the amount of not less than one half hour per week on the " humane treatment and protection of dumb animals and birds; their lives, habits, and usefulness, and the important part they are intended to fulfill in the economy of nature." The Illinois law is similar, but is the most extended of any of the state laws. The Pennsylvania law provides for not more than one half hour per week on the " kind treatment of birds and animals," and those of Maine and Washington for not less than ten minutes. The law of Texas prescribes that " suitable instruction shall be given in the primary grades once each week regarding kindness to animals of the brute creation and the protection of birds and their nests and eggs." The New Hampshire statute provides for " a well prescribed reading course dealing with the principle of the humane treatment of the lower animals." Idaho and Utah have been reported as having compulsory requirements.

In England, France, and Germany, humane education is in no degree compulsory, although in all varying effort is made to link up private humane effort with the work of the schools. Literature is given to pupils and teachers, teachers' conferences are held, and other devices are employed similar to those used in the United States. In France activities have perhaps been more systematic and effective than in the other countries. Humane instruction there finds a place in the schools incidental to the general scheme of moral and civic instruction. More than six thousand *Sociétés Protectrices* have been formed in the schools under the patronage of the national society for the protection of animals. The English *Code of Regulations for Public Elementary Schools* contains a note to the effect that instruction " should be especially directed to the inculcation of courage, truthfulness, cleanliness of mind, body, and speech, the love of fair play, consideration and respect for others, gentleness for the weak, kindness to animals," and other considerations. But English humanitarians lament their failure to carry out this suggestion in specific ways.

R. C. M.

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HUMANISM. — See Course of Study, Theory of; Culture; Humanities; Liberal Education; Renaissance and Education.

HUMANISM AND NATURALISM. — In educational literature, humanism has usually a specific meaning, indicating a distinctive intellectual tendency that marked the revival of learning in the fifteenth and sixteenth centuries. For that aspect of humanism, see Renaissance and Education.

Under the present caption, only a somewhat rarer and also looser signification of the term, belonging to certain problems in the philosophy of education, receives consideration. From the side of educational practices, this philosophical question originated in the just mentioned historic sense of humanism. As a consequence of the revival of learning (along with the backward state of the natural sciences), linguistic and literary culture succeeded theology as the controlling factor in higher education. By the nineteenth century, however, natural science had made such extraordinary advances that its representatives were naturally restive, and even rebellious. They challenged the practical supremacy of language and literature, and attacked on intellectual grounds the theories that were advanced in justification of this supremacy. Upon the practical side, the case was decided in favor of the claims of the natural sciences — not, of course, that the humanistic studies were excluded, but that the claims of scientific study were admitted upon substantially equal footing, whether by insertion of some natural science into the old classical course or by affording students an option between a literary and a scientific course. The adjustment thus far reached represents, however, a working compromise through concession to forces strong enough to force recognition, rather than a solution based upon any generally recognized philosophy of the relations of man and nature to each other. As ideals humanism and naturalism are perhaps more sharply opposed to each other now than at any previous period.

Humanism may be defined as the conviction that spiritual and ideal values are of supreme rank in the make-up of reality, and that these values are most adequately expressed in the great or classic achievements of humanity in literature and art — especially literature. Naturalism rests upon the conviction that, negatively, humanism is a survival of the geocentric medieval philosophy, with its false conception of the place of the earth and of man in the universal scheme, and with its exaggerated teleological interpretation of things; positively, that man and his affairs are a subordinate part of nature, seen in their true place only when nature is made the chief and primary object of study. Incidentally, naturalism almost always has as one of its implications that language and literature are too artificial, factitious, and, as it were, ornamental, to be a sound basis for education. Science, it is urged, presents mankind with truths concerning realities of existence; language and literature with man's accidental and fanciful reactions to these realities.

Philosophically viewed, the controversy is a reflection of the time-worn discussion of the relations of spirit and matter, mind and nature, subject and object; and the supposed antagonism of naturalism and humanism originates in dualism (*q.v.*) respecting these concepts. Greek classic philosophy presents, upon the whole, a view of things in which there is a balance between naturalism and humanism. From one standpoint, that of value, a humanistic idealism dominates; the life of reason as exhibited in the realization of distinctively human functions is the supreme moral good, and hence the ultimate measure of worth in education. This conception was embodied in the Aristotelian conception of a *liberal* education and in the notion of the liberal as distinct from the mechanical and industrial arts. But reason is not a peculiar and isolated property, much less creation, of man. On the contrary, nature, in virtue of its orderliness, and especially in view of the fact that its order shows itself in the tendency to achieve specific ends, is itself rational, and the attainment of rationality by man is nothing but the realization in conscious thought of the relations immanent in nature. From the side of conditions or efficient means nature also, not man, is supreme. The values, or goods, of life are absolutely dependent for their achievement upon the efficacious workings of physical conditions; even the contribution of human deliberation and effort, regarded as a causal factor, falls within the scope of nature. Or, as Aristotle puts it, mind is the actualizing, the complete energizing, of the body, a view which makes it impossible to regard mind as a separate independent causal force. In short, classic Greek idealism was idealistic in the sense that it had a teleological view of nature. Nature and mind were not regarded as two forces working either together or against each other, but as means and end, causal conditions and final values, potentiality and actuality.

Medieval philosophy, even when professedly following Aristotle, introduced two profound modifications into this view. On the one hand, nature as it now exists is fallen or corrupted, being implicated in "an aboriginal catastrophe," the denial by the first man of God's will as law, and the substitution for it of human inclination. This profound perversion of reality affected all physical nature, in itself completely good, as well as human nature. The inevitable result (taken of course in connection with the barbarous state of society) was a depreciatory attitude toward all knowledge of a natural kind, in contrast with knowledge having to do with man's redemption — the subordination, both in philosophic theory and educational practice, of natural knowledge to supernaturally revealed science, or theology. Medieval philosophy also inverted the relation between mind and nature, for it regarded mind as the sole ultimate *efficient* cause of natural existence, instead of conceiving mind as the *final* cause, or good, of natural things. Thereby a metaphysical dualism of spirit and matter was superadded to moral dualism of the first state and ultimate destiny of man as contrasted with the present state of nature.

Renaissance philosophy was humanistic in both the narrower and the wider sense of that term. It found in the revival of Greek philosophic thought a means of justifying the growing interest in the phenomena of physical and human nature. Like Greek thought, it rested in a conception which united humanism and naturalism. Naturalism was opposed to supernaturalism, and hence represented the means of satisfying distinctively human, instead of theological, potentialities and aims. The prevailing way of conceiving the relation of man and nature was that of a microcosm to a macrocosm. Man was in small edition that which the universe was in large. As Windelband truly says, the natural science of the seventeenth century was the daughter of the humanism of the sixteenth century.

This union, resting upon the use of Greek thought and the emulation of the free Greek spirit to justify a free and full satisfaction of human capacity through natural conditions, was, however, soon undermined from both sides. Humanism became more technical, more literary and philological, and less philosophical. Moreover, the rise of the Protestant-Catholic controversy diverted the study of language and literature from social and æsthetic channels, and made its use a weapon of religious dispute. As natural science worked itself free from the earlier mystical and imaginative traits, it became more and more purely mechanical, more and more indifferent to teleological considerations. Nature mechanically viewed is indifferent to mind, or even opposed to it, since the chief mark of mind is its purposiveness. This tendency of natural science toward dualism was reënforced by the growing moral and political interest in the self or ego, and by the development of the idea that the final source of certain knowledge (as against the authoritative impositions of dogmatic beliefs), was to be sought simply within the inner self, the field of personal consciousness. These two latter factors conspired with the discovery of the "inner world" as a field for literary exploitation, to mark off mind, reason, as a realm by itself, sharply contrasted with nature. Natural and mechanical science was concerned with the "object," and over against the object stands the "subject," defined and described in terms exactly antithetical to those applicable to nature, or the object. The resulting dualism motivates directly all the philosophic problems of the seventeenth century, and supplies the background of the controversy between naturalism and humanism in education.

The difficulties and problems that arise in rigid philosophic dualism are paralleled in educational controversy. By assumption, there are two separate words, and yet both of them are necessary to make up the whole account of our real experience. The result is, inevitably, whether in pure theory or in educational, a mechanical compromise assigning one isolated region to mind and humanistic study and another to matter and to naturalistic studies. The same forces, however, that have tended to break down the rigid dualism of mind and matter have operated, though independently, to render questionable the division of studies into exclusively human and exclusively physical. The rapid development of the historical, anthropological, economic, and other social sciences has introduced a large and important body of material that will not fit easily into either of the older rubrics. Obviously humanistic in matter and import, it also emphasizes both in its subject matter and its methods of explanation processes that connect man's life with natural conditions. The theory of evolution when applied to humanistic subject matter tends also to bring out its continuity with natural conditions. Industrial conditions are seen to have the most intimate bearing upon human affairs, and they also are bound up with the natural sciences. As long as economic affairs were regarded as out of the pale of serious concern by all those occupied with man's higher interests, it was an easy matter to sidetrack them intellectually and educationally. Now that the close connection of economic conditions with success in attaining the highest political and moral status of society is generally recognized, the thinness and superficiality of a humanism that excludes from attention all reference to industry, commerce, and applied science become increasingly obvious. As a consequence, contemporary philosophy and contemporary educational theory may be said to be confronted with a common problem: The discovery of the common background or matrix in which humanistic and naturalistic interests are united; and the tracing of their respective differentiations from this community of origin, — a differentiation, however, which should not become a separation, and which, accordingly, secures the possibility of fruitful interaction between them whenever desired.

J. D.

See IDEALISM AND REALISM IN EDUCATION; NATURE.

HUMANITIES, THE. — This term came into use in the fifteenth and sixteenth centuries as an English equivalent of the Latin *literæ humaniores*, meaning in effect literary culture, "letters." The sense of the term was probably influenced by reminiscence of the use of the word *Humanitas* by Aulus Gellius and Cicero to denote the liberal culture befitting a man as a man. It was influenced by a differentiation from "divinity," so as to designate the studies of human interest as distinct from the theological studies which had dominated medieval education — especially to designate secular instead of "sacred" rhetoric, poesy, and grammar. This wider sense of the term shaded naturally into a narrower one. Since as a matter of fact the material of literary secular culture was at first the Latin, and then the Greek languages and literatures, the term "humanities" came to mean almost exclusively the study of Latin and Greek. Humanity is still in use in the Scottish universities as a technical term for the study of Latin; and at Oxford the classical studies are known as *literæ humaniores*. Generally speaking, in the seventeenth century a humanist meant a grammarian or philologist. In the nineteenth century the use of the term was influenced by the conflict in higher education between the classical studies and the sciences of nature. In the course of the controversy, the term tended to broaden its meaning, and to revert to designating whatever concerns man as distinct from physical nature.

J. D.

See HUMANISM AND NATURALISM; LIBERAL EDUCATION; NEO-HUMANISM; RENAISSANCE AND EDUCATION.

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HUMBOLDT, FRIEDRICH WILHELM CHRISTIAN CARL FERDINAND VON (1767–1835). — The German philologian and statesman in his short connection with the educational administration of Prussia exercised a strong influence on its future development. A profound scholar himself, he readily seized the opportunity afforded by his position to introduce the characteristic features of the New Humanism (*q.v.*) into Prussian higher education. But from another direction, too, his strong faith in independence and self-activity led him to introduce much-needed reforms in all branches of education, so that in the universities the spirit of academic freedom was given the greatest scope, while in the elementary schools the Pestalozzian methods and the encouragement of individual development found a strong advocate in Humboldt. Educated privately by skillful teachers, he later attended the universities of Frankfort-a-O., Göttingen, and Jena, interested above all in the humanities and especially in Greek culture. In 1790 he entered the Prussian civil service, but retired within a year. In 1802 he was appointed minister to the Vatican, where his duties did not prevent him from forming a circle of friends interested like himself in classical studies. In 1808 he became Privy Councillor and Director of Ecclesiastical Affairs and Public Instruction, an office which he held for about eighteen months. In this brief period he instigated the reorganization of the system of admission to the universities which resulted in new regulations for the *Abiturientenprüfung* (*q.v.*). An important step in advance was made by the introduction of an examination for secondary school teachers. Hitherto appointments were made locally, and the candidates were as a rule students of theology or clergymen. Humboldt desired to establish a secular teaching profession. The examination of teachers was placed in the hands of a commission which should also consider educational methods and systems, new curricula, textbooks, and other publications. To reform elementary education young men were sent to Yverdun to study Pestalozzi's work, while through Humboldt's influence Zeller was enabled to open a normal school at Königsberg, based on Pestalozzian principles. Humboldt himself evinced an interest in the teaching of drawing and music. The whole work of Humboldt was directed to raising the cultural standards of the nation and to give it a feeling for the beautiful and æsthetic. In 1810 Humboldt retired from educational administration, but in the interval up to his complete severance from political life in 1819 he held several important posts which required delicate diplomatic ability.

As a scholar Humboldt ranks high in the field of philology. He established a reputation as a critic by a review of Goethe's *Hermann und Dorothea* in 1800. His chief works were, however, in linguistics, the principal of these being: *Prüfung der Untersuchungen über die Urbewohner Hispaniens vermittelst der baskischen Sprache* (*Researches into the Original Inhabitants of Spain by means of the Basque Language*, 1821); and *Uber die Verschiedenheit der menschlichen Sprachen und ihren Einfluss auf die geistige Entwickelung des Menschengeschlechts* (*The Heterogeneity of Languages and its Influence on the Intellectual Development of Mankind*, 1836), a treatise on the philosophy of speech and language as the peculiar expression of a people's characteristics. His works were published in seven volumes (*Gesammelte Werke*) in 1840–1852, and under the title *Gesammelte Schriften* in 1904–1908. For portrait, see p. 586.

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HUME, DAVID (1711–1776). — The philosopher; born and died in Edinburgh. Hume's works include *A Treatise of Human Nature*, *An Inquiry concerning Human Understanding*, *A Dissertation on the Passions*, *An Inquiry concerning the Principles of Morals*, *Political Discourses*, *History of England*, *Dialogues concerning Natural Religion*, essays on *Suicide*, the *Immortality of the Soul*, *Miracles*, *A Particular Providence and a Future State*, various other *Essays Moral and Political*, and a short autobiography. He left no strictly educational writings, and his influence on the history of education was so indirect that it is impossible to estimate its amount. But in psychology, ethics, metaphysics, history, religion, and economics his influence has been very great indeed. In psychology and metaphysics he carried through the prevailing doctrines of Locke (*q.v.*) and Berkeley (*q.v.*) with unrelenting logic to conclusions so repugnant to common sense that (as he fully realized) neither he nor anybody else could really believe them. Taking his cue from Berkeley's doctrine that we can form no conception of any material substance beyond our own ideas, such as these are usually supposed to reveal, he proceeded to prove that neither can we form any conception of a mind or any other reality behind them, such as they are usually supposed to belong to. Thus he resolved one's very self into "nothing but a bundle or collection of different perceptions (*i.e.* thoughts and feelings) which succeed each other with an inconceivable rapidity, and are in a perfect flux and movement."

This doctrine of the self is one example of the general philosophical "skepticism" in Hume which aroused Kant to write his *Critique of Pure Reason* and stirred Thomas Reid and his Scottish followers to develop the philosophy of "common sense," all more or less unsuccessful attempts to solve the problem of the possibility and nature of knowledge. Neither British nor German philosophy can be fully understood without a knowledge of Hume.

Hume's doctrine that a cause is practically nothing more than a uniform antecedent, and need not in any way resemble or be "greater" than its effect, has helped us to break away from a vast amount of medieval philosophizing, and prepared the way not only for the agnosticism of Huxley and Spencer, but for a genuine philosophy of evolution. In ethics and economics Hume clearly enunciated the principles afterwards worked out so successfully by his younger friend Adam Smith. Hume's *Essay on Miracles*, intended to be "an everlasting check to all kinds of superstitious delusions," did not attempt to prove that miracles cannot happen, but only that no amount of testimony is sufficient to prove one. Our only reason for believing in testimony at all is our experience of its truthfulness — of the usual or uniform conformity between a man's statements and the facts he tells about. But we mean by a miracle a violation of the laws of nature — a single event contrary to the uniform experience of all mankind. To adduce the strongest kind of testimony for a miracle is therefore only to pit one experience of uniformity against another. The very thing that makes us trust the witness makes us disbelieve his tale. But in fact the testimony usually adduced for miracles is not strong at all. The witnesses are not usually trained observers, and they are influenced by religious enthusiasm and our common love of wonders. "Miracles" are commonest amongst ignorant peoples; and the more you believe in the miracles of any one religion, the more you must discredit those of every other! Hume's argument concerning a future state is somewhat similar to that concerning miracles. If we happen to believe in such a state, well and good; but the fact that things are not altogether as they should be in this world does not *prove* that they will be better anywhere else. In these two essays Hume shows the influence of his historical training. In the *Natural History of Religion* he discussed historically the probable origin of popular religious beliefs. H. A. A.

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HUMPHREY, HEMAN (1779–1861). — Second president of Amherst College; was born at Hartford, Conn., on Mar. 26, 1779. He was instructed by private tutors, and was graduated from Yale College in 1805. For several years he served as pastor of Congregational churches. He was president of Amherst from 1823 to 1845. He proposed the establishment of a department of education in the college for the training of teachers, but the proposition was never carried into effect (see EDUCATION, ACADEMIC STUDY OF, in the United States). In 1838 he traveled in England, France, and Belgium for the purpose of inspecting educational institutions. He was also active in the cause of temperance. His published writings include numerous addresses on education, an edition of the New England Primer, and a work on *Domestic Education* (1840). W. S. M.

See AMHERST COLLEGE; EDUCATION, ACADEMIC STUDY OF.

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TYLER, WILLIAM S. *History of Amherst College.* (Springfield, 1873.)

HUMPHREY, or HUMFREY, LAURENCE (*c.* 1527–1590). — Writer on the education of nobles in the time of Queen Elizabeth, was educated at Cambridge and at Oxford, was B.A. in 1549, and, becoming M.A. in 1552 from Magdalen College, Oxford, lectured in that college on natural philosophy and on moral philosophy. In 1553 he joined the Protestant exiles in Basle, and then in Zürich, and afterwards at Geneva. In 1560 he was made Regius Professor of Divinity in the University of Oxford, and in 1561 he was chosen president of Magdalen College, Oxford. Humphrey was permeated with the Calvinistic views in religion, acquired abroad, and, as Anthony à Wood says, "did not only . . . stock his College with a generation of Nonconformists, which could not be rooted out in many years after his decease, but sowed also in the Divinity School . . . seeds of Calvinism, and laboured to create in the younger sort . . . a strong hatred against the papists."

Humphrey's chief educational work was entitled *The Nobles, or Of Nobilitye.* It was first published at Basle in 1560, in Latin, as *Optimates, sive de Nobilitate, eiusque antiqua origine, natura, disciplina.* His own English translation appeared in London in 1563, as *The Nobles or of Nobilitye. The Original nature, dutyes, ryght and Christian Institution thereof.* Joined with it is an English translation of the *Lytle Treatyse of Philo a Jewe, concernynge Nobilitye.* Humphrey's *Nobles* is dedicated to Queen Elizabeth and also to the Right Honourable and Worshipful Gentlemen of the Inner Temple.

Humphrey lays down the demand that the Nobility ought to learn and to give ear to wise counsels. He recalls the names of previous writers on the subject, Lucas Gauricus (Bishop of Civitate), and Hieronymus Osorius, and stoutly defends the distinction of classes as against Anabaptists and others. At the same time Humphrey declares that as to an "idle" Noble, he allows him "not so much as one inch of Nobility." Christ is the fane and type of Nobility. Nobles must "believe soundly and live uprightly," and have piety toward their country, a congenial topic for the Elizabethan age. They must be "liberal," a quality most proper to noblemen, and this liberality must be shown towards the learned. To these the nobleman's chest should be open. Similarly, he must be "liberal" to God's saints, and hospitable toward strangers. Justice must characterize the noble in all his dealings. With special regard to "institution" or education, it is the duty of the nobles themselves to cultivate virtues. Temperance must be cultivated. Sports are to be in moderation; and only for the purpose of making men manlier. But learning is a pursuit worthy of the Noble, and Humphrey declares he will give not merely his own opinion, but describe the "ancient princely way" of education. A learned careful teacher is necessary even for the elements. Grammar should be learned "briefly." The shortest of Cicero's *Epistles* follow. Then Dialogues, *e.g.* those of Erasmus (*q.v.*), and Castalio (*q.v.*). Terence must be taught for his colloquial phrases, but with care that nothing undesirable be acquired from him. Even at first Greek and Hebrew should be learned ("preposterously do all Universities, schools and teachers that contrary it.")

Another book by Humphrey, of considerable importance in its age, was the following: *Interpretatio Linguarum: seu de Ratione convertendi et explicandi autores tam sacros quam profanos, libri tres.* Basileæ, 1559. F. W.

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Report of U. S. Commissioner of Education, 1903, Vol. I, pp. 324-327.

HUNGARY, EDUCATION IN. — Hungary, constitutional kingdom: area of Hungary proper, 109,007 square miles; population, 16,838,255 (1900); ethnical elements: Hungarian or Magyar 8,702,301; German, 2,135,181; Slavonic people: Slovak, 2,019,641; Roumanian, 2,799,479; Croatian, 1,678,569; Servian, 1,052,180; others, 397,761. Division of population by religion: Roman Catholic, 9,919,913; Greek Catholic, 1,854,143; Greek Oriental, 2,815,713; Evangelical Augs., 1,288,942; Evangelical Helv., 2,441,142; Unitarians, 68,568; Jews, 851,378; others, 14,760. Capital, Budapest, population 732,322. Minister of Public Instruction and Worship Count John Zichy.

Historical. — The educational history of Hungary hardly begins before the influences of the Reformation made themselves felt in the sixteenth century. Stephen I, it is true, had as early as the eleventh century ordered the establishment in every parish of schools for the teaching of religion and reading, but the decree had little permanent effect. In 1854 the diet ordered that the funds of the despoiled monasteries should be used to create schools, and by this action stimulated the Catholic Church to new educational activity. But placed between the Turks and the Austrians, the Hungarians had little opportunity for development in the sixteenth and seventeenth centuries. After the crowns of Hungary and Austria were united in 1689, the educational history of the two countries developed along similar lines until the nineteenth century. A wholesome rivalry continued between the Protestant schools and Jesuit colleges until the suppression of the latter in 1772, and under the protection of Maria Theresa the national spirit was fostered without interference. In 1777 the *Ratio Educationis*, a Hungarian edition of Felbiger's (*q.v.*) Austrian regulations, was promulgated, but, since it identified education with the Catholic Church, was refused recognition by the Reformed Church. The anti-national measures of Joseph II, including the exclusive use of the German language, aroused so much opposition that they were withdrawn in 1790, with the exception of the freedom of worship. Before the close of the eighteenth century, the distinctive features of Hungarian nationality, pride of language, and the spirit of religious and social toleration had been wrought into the schools.

The doctrines of the French Revolution of 1789 found ready sympathy in Hungary; but its manifestation was checked by the Napoleonic conquests. The deeper movement of 1848, which swept over all western and central Europe, revived the spirit of Hungarian patriots, and, led by Kossuth, they achieved momentary independence. The Estates of the Realm were replaced by a national assembly, and the draft of an elementary education law, conceived "in a modern and national spirit," was drawn up by Baron Joseph Eötvös, the first Hungarian Minister of Education. The effort was ended by the disastrous War of Independence, and the absolute rule that followed destroyed the legal basis of the old school system. No other was adopted until the reorganization of the Empire after the brief war with Prussia, which ended in the defeat of Austria in the decisive battle of Sadowa. By the compromise of 1867, Austria and Hungary became two distinct states under a common sovereign, and the same year the Emperor of Austria, Francis Joseph, was lawfully crowned King of Hungary, which was once more assured entire control of its internal affairs.

The Ministry of Public Instruction. — The political idealism which marked the deliberations of the Hungarian leaders in the short term of independence achieved in 1848 found new and permanent expression in the measures adopted for the internal conduct of the state in 1867. Baron Eötvös was again made Minister of Worship and Public Instruction, and a central department of education was constituted which by its scope and divisions illustrates the completeness of the service under its direction. The ministry is organized in ten departments, including distinct departments of higher, secondary, and elementary education; practically five departments are subdivisions of the last named. The staff of the ministry includes a corps of inspectors and several educational experts. The Hungarian Board or Council of Education formed by the appointment of the King or the minister is primarily an advisory council to the minister; but it also has important executive functions. The laws pertaining to education are prepared and enforced by the minister who has exclusive jurisdiction over schools maintained by the State. The right of inspection is also exercised over other schools so far as consistent with their legal autonomy and in proportion to the measure of state assistance which they receive.

Elementary Education. — In his capacity as Minister of Public Instruction Baron Eötvös, in 1868, one year before the adoption of a new education law by Austria, drew up and carried through the legislature the law of elementary education in Hungary (Act XXXVIII, 1868), making the education of all children compulsory, in day schools from the ages six to twelve; in continuation schools (Sunday or evening) from twelve to fifteen. The civil officers of the parish were required to compel the enforcement of the compulsory provisions. Children educated privately were required to pass an annual examination at the elementary public school. The duty of establishing and maintaining schools was imposed upon the parish authorities; but denominational schools were recognized. It was further ordered that where the local authorities and the religious denominations should both fail to make due provision of elementary schools, the Minister of Public Instruction, acting in the name of the State, should provide schools. As a consequence of the legal provisions the elementary school system comprises national schools, public schools managed by the civil parish (cities, villages, etc.), denominational schools adopted as public schools, and schools under private managers. A measure of unity is secured by legal conditions binding upon all public schools. These conditions comprise a common program and specified requirements as to school buildings and classrooms; they make eighty the limit of the number of pupils in a school; they require that boys and girls shall be taught separately and that the schools shall be open for at least eight months a year in the country and nine months in the city. Teachers must possess the legal qualifications, must receive, at least, a certain minimum salary, and must be guaranteed a pension after the prescribed period of service. Finally the law requires local inspection of schools by duly qualified officials. These provisions appear the more remarkable when it is remembered that the Hungarian school law preceded by thirteen years the first of the series of laws regulating the present system of primary education in France, and by two years the passage of the act of 1870 by which the English government assumed direct responsibility for the education of the masses. In its regard for established customs and vested interests, the Hungarian law recalls the salient provisions of the English Act, which was undoubtedly inspired in part by the interchange of counsels between its author, Mr. W. E. Forster (*q.v.*), and his celebrated contemporary, Baron Eötvös.

The law of 1868 prescribed somewhat minutely the internal organization of the schools. It distinguished two courses of elementary education: the six years day school course and the three years continuation course, and required that state schools and communal schools should make provision for both. The six years school may be under the management of one or more teachers, and the schools are called undivided or divided (graded) accordingly. Although the law required separate schools for boys and girls as a matter of theory, mixed schools are very common. The obligatory program for every school includes, besides the three elementary branches, religion and ethics, grammar, geography, natural history, natural science, civic rights and duties, history of the constitution, elements of geometry, drawing, singing, physical exercises, needlework for both boys and girls, and practical training in agriculture and gardening. An official syllabus is issued by the Minister from time to time, dealing with the purposes and matter of the several subjects and giving extended and admirable suggestions to teachers for the work of instruction. A section of the syllabus is devoted to the undivided schools, which present special difficulties. The national language and literature (Hungarian or Magyar), the national history and the rights and duties of citizens form the very core of the school instruction; hence the intense sentiment of national life diffused throughout the land. Second only to this group of studies is the instruction in natural science, with its complement in the training in agriculture. The latter, which begins in the fifth school year, is thoroughly systematized and pursued with enthusiasm as an essential factor in national prosperity. The branches of elementary instruction are reviewed in the continuation schools with some extension and with greater regard to their ethical and social bearings. By the official syllabus of 1902, the continuation course in agriculture was brought into closer relation with the immediate local conditions, and, as a result, the technical side of the continuation schools has been highly developed in parts of the country. The greater number of these schools have farms or gardens attached; forty-five schools of this class have large experimental farms and are provided with special teachers of agriculture.

The judicious spirit which marks the law of 1868 is illustrated by the special provision for communities below and above the general level of the country. The parish authorities were charged to provide for the instruction of children living on farms within their jurisdiction, either by means of schools or itinerant teachers. This is a matter of peculiar significance, since in the great Lowland (Alföld), which constitutes a third of the entire territory of the realm, the greater part of the inhabitants live on widely scattered farms and are unable to comply with the school law; hence the State has intervened and is supplying the means of elementary education to these scattered homesteads. In other parts of the country, especially in the northwest and southeast districts, the multiplicity of languages and of church affiliations threatens the unity of elementary education. Here again the State intervenes, and without interfering with parochial or other schools, establishes state schools.

The organization of city schools differs from that of rural schools not alone through force of circumstances, but by direct enactments.

These provide for city high schools based upon the fourth year of the elementary school course and continuing the instruction of pupils on quite different lines. The city schools for boys, which are practically the same as the burgher schools of Austria, are organized in four classes (originally in six), and their studies are the same as those of the four junior classes, or forms, of the secondary schools. The crowded obligatory program includes religion and ethics; the mother tongue of the pupils, style, and history of literature; the Hungarian language; the German language; arithmetic, including practical arithmetic; geometry; the geography of Hungary, and universal geography; history; natural history; physics; chemistry (the last three with special regard to industry, commerce, and agriculture); rural economy or industry (in accordance with the wants of the parish and the surrounding country); outlines of common and civil law; bookkeeping; drawing and caligraphy; singing; gymnastics and drill (*Regulations* 1879). Recently sloyd was introduced. Optional branches are Latin, French and other languages, and music. The city schools for girls included four years or forms from the start. Pupils who complete the course are admitted to the schools of industry and commerce for girls, or, if they pass examination, to the fifth class of girls' high schools; if fourteen years old, they are eligible for admission to normal schools (*Regulations* 1887).

Teachers. — The training of teachers was a cardinal principle in the scheme of national education comprised in the law of 1868. Normal schools existed in Hungary before this date, but the law made explicit provision for their classification, distinguishing between normal schools for the preparation of teachers of elementary schools and those for teachers of higher schools, and fixing the standards of graduation, conditions of students' life, etc. All the authorities entitled to establish elementary schools may maintain normal schools, but they must conform to the legal requirements. Official regulations of 1903 introduced uniformity for all normal schools of the same order, state and private. The program of the elementary normal schools is arranged for four years, and comprises general subjects and those strictly professional, the latter being enforced by the critical observation of the work of student teachers in the model or practice schools. The Hungarian language and literature, Hungarian history, and the German language are obligatory subjects in the course; other languages spoken in Hungary are optional. In the normal schools for women, which follow the same general program as those for men, special attention is given to domestic economy, household work, artistic embroidery and needlework, dairy work, care of poultry, etc., and the official instructions emphasize the importance of these industries, and of women's influence as exerted through the home life. The recent movement for the higher education of women promises also to open up other channels for the exercise of their artistic and manual skill.

Above the ordinary normal schools are two state colleges which prepare teachers for the higher elementary and city schools, and serve as models for similar colleges maintained privately. The course of instruction covers three years, and is conducted on the group or department system. The central groups are: (1) languages and history; (2) mathematics and natural science. The subjects comprised in each are arranged in special or sub-groups; all additional branches form side groups. By reason of this arrangement students may enter for special subjects and at any time. In all sub-groups the following subjects are obligatory: (1) preliminary study of philosophy (psychology and logic); (2) theory of education and teaching, with history of educational theories and institutions; (3) history of Hungarian literature; (4) teaching in the practice schools. One of the side groups comprises music, vocal and instrumental, which is included in the course of instruction in all training colleges. In school programs generally, Hungarian music is second only in importance to the Hungarian language and literature.

Tuition is free in all state normal schools, and the expenses of boarding are covered partially or entirely by scholarships. Intending teachers, whether graduates of normal colleges or others, must pass examination for a teacher's diploma, conducted by a government board composed of members of a training college staff and representatives of the ministry. Separate boards are constituted for the examinations for the different grades of diplomas. Every diploma must certify that the recipient knows the Hungarian (Magyar) language, a requirement which was extended to teachers of denominational schools by a law of 1907. In all continuation schools the Hungarian language has been made the medium of instruction.

Conditions of Service. — Teachers of state schools are appointed by the Minister of Public Instruction; of communal public schools by local boards; of denominational schools by the managers of the same. The teacher of a public school has a life tenure unless removed for crimes or misdemeanors, and in accordance with recent laws a teacher must receive a specified minimum salary, whether engaged in a public or private school (Acts XXVI and XXVII, 1907). A pension fund is maintained partly by state and local appropriations, and partly by assessments on the individual salaries, and teachers can claim a pension after ten years' service; after forty years' service they receive full pension (Acts of 1872, 1891). From the same fund aid is extended to the widows and orphans of teachers. The solicitude for the welfare of teachers has led to the creation of "Teachers' Homes," where the children of teachers and school officers are cared for while pursuing professional study. The Teachers' Home in Budapest, the Francis Joseph Home, was opened in 1899. The Hunyadi Teachers' Home at Koloszvár began operations in September, 1904. Both the intellectual and social welfare of teachers are promoted by their membership in teachers' guilds, which is required by the law of 1868. These guilds, or associations, are animated centers of pedagogical discussion and reform as well as mutual benefit societies. Teachers have the advantages of the *Hungarian Museum of Educational Appliances* at Budapest, which was opened in 1877 and in 1906 combined with the Teachers' Library. The annual appropriation for the entire institution is about 12,000 crowns ($2400).

Unifying Influences. — In the union of public and denominational schools, the Hungarian system of elementary education resembles that of England. But whereas the sense of national solidarity is preserved in England by many influences stronger than the school, in Hungary the school is the very source of its existence. Hence, of necessity, the Hungarian language is required in all schools, elementary and normal, since unity of language is essential to national consciousness. Moreover, so far as possible, the law seeks to impart a common character to all public schools of the same order, whether established by the State or the commune, and to this end has made very careful provision for their supervision and inspection. State schools are under the control of boards of trustees formed partly by election and partly by appointment. Parish schools (municipal and district) are under local school boards whose members are appointed by the local administrative councils. These school boards attend to the external affairs of the schools, including the appointment of teachers, their salaries, etc. The professional supervision and inspection of public schools is intrusted to the royal inspectors and the local administrative councils. The inspectors are appointed by the King upon the nomination of the Minister, one for each county or school area. They are the responsible heads of the system, exercising practically the same authority as a state superintendent in the United States; they are also the intermediaries between the local authorities and the ministry. The chief inspector is assisted by a corps of sub-inspectors.

The duties of the local council in respect to school affairs are judicial and executive (Act XXVII, 1876, amending provisions of the act of 1868). Although the managers of denominational and other private schools have independent control of their institutions, they are subject in a measure to the supervision of the royal inspector and to the local councils.

Statistics of Elementary Schools. — According to the official report, for the year 1907, the total number of children in Hungary of the obligatory school age was 3,125,000 (1,564,000 boys, 1,561,000 girls). The enrollment in elementary schools was 1,848,176 children (948,918 boys, 899,258 girls); in general continuation schools 347,000; in the agricultural continuation schools 140,655; and in the higher schools of this class 8356, or a total enrollment in continuation schools of 496,011. This gives a grand total of 2,344,187, or 74 per cent of the children of obligatory school ages. The corresponding total for 1909 was 2,775,278. The number of elementary schools in 1907 was 16,561, classified as follows: State schools, 2046; district, 1473; denominational, 12,734; private, 271; proprietary, 37; of the total number of schools 68.5 per cent were "undivided" schools with one teacher each. The number of teachers engaged in public elementary schools was 30,194, of whom 28,600, or 94 per cent, had government diplomas. Of the elementary schools 11,527 had a general, 2040 an agricultural, 102 a general and an agricultural continuation school attached. 57.67 per cent of the said schools used Hungarian (Magyar) as the exclusive language of instruction; while in 17.97 per cent other languages of instruction were used in addition to Hungarian. Consequently the percentage of schools where Hungarian is the language of instruction may be put at 70.91 per cent. In 1907 the amount appropriated for state elementary schools was 10,570,010 crowns ($2,114,002); the amount appropriated for the subvention of public parochial, denominational, and private schools was 4,864,000 crowns ($972,800), or nearly half the sum appropriated for schools supported entirely by the State.

Supplementary Agencies. — *Infant Homes.* — The system of infant protection for which Hungary is noted may be said to date from the efforts of the Countess Teresa Brunswick, who, with the support of Count Széchényi, the leader of the reform movement in Hungary in the early years of the nineteenth century, established the first infant home at Buda, in 1828, called *Garden of Angels* (*Angyalkert*). In 1836 an association was formed for carrying on the work, in which several prominent men, among them Louis Kossuth, were actively engaged. Through the efforts of this association a training college was established for directresses of infant homes. In 1848, when the War of Independence broke out, eighty-nine homes were in operation, all of which were greatly crippled by the war. Baron Eötvös proposed to include this work in the measures of 1868 pertaining to popular education; but, owing to the objection of the legislature, the matter was deferred for some years. Meanwhile the first Froebel kindergarten was opened (1869) and an association formed to promote this work. This association and the *Hungarian Infant*

Protective Association are still active centers of efforts in behalf of young children. The first legislative provision concerning this matter deals with the qualifications of teachers of infant schools (Act XXXII, 1875). The complete organization of the system of infant protection was accomplished by the law of 1891 (Act XV). The special features of the system are: provision for the establishment of infant homes by the State and by local authorities; the requirement of special training for the teachers and of other persons on the staff of the homes; the obligation placed upon parents to send their children between the ages of three and six, who cannot be properly cared for at home, to infant homes, under penalty of a fine ranging from twenty fillér to one crown. The magnitude of this work is indicated by the following statistics: number of infant homes reported in 1906–1907 (*a*) state, 582; (*b*) municipal, 1421; (*c*) denominational, 338; (*d*) others, 254; total, 2595; among these are 1913 which make use of the Hungarian language only. In these homes were 245,214 children, of whom 57 per cent were Hungarian-speaking; there were 1913 certified mistresses; 427 certified nurses and 332 uncertified nurses; total staff, 2672; the expense of maintenance was, in round numbers, 3,000,000 crowns ($600,000).

Among the marked features of infant homes should be noted the admirably planned and equipped buildings. They are provided with ample halls, playgrounds, and covered courts, where the children engage in free sport and directed games. The system of training is remarkable for its sympathetic adaptation to the impulses and capacity of childhood; the awakening of the national spirit by songs, stories, and pictures of national life; for the use of the Hungarian language; and for the grasp of Froebelian principles, with modifications to suit the national circumstances and purposes.

Defective Children. — The provision for the care and training of the blind, the deaf and dumb, and of children who are mentally and physically defective, has been brought under the supervision of the State, in the same manner as the system of popular education. The following statistics relate merely to the educational side of this work, as reported in 1907.

INSTITUTIONS	NUMBER OF CHILDREN	FUNDED CAPITAL, CROWNS
Day homes	1652	1,900,614
Orphan asylums	4314	17,512,007
Children's Aid societies	4339	660,989
Summer colonies, etc.	1032	230,000
Institutes for the Deaf and Dumb (3)	91	1,212,368
Institutes for the Blind	88	131,000
Homes for child cripples	64	131,000
Home for feeble-minded children (1)	105	32,529

Industrial and Commercial Education. — Industrial education has a long history in Hungary, beginning, as in other countries, with schools established by certain religious orders, and gradually coming under the supervision and fostering aid of the State. Commercial education has a briefer history, and although regulated by special laws was left largely to the initiative of societies and private managers until the close of the last decade. The significant facts in the progress of this practical education since 1867 are the measures adopted for their regulation by the State.

The agencies for both industrial and commercial training fall into two general classes, apprentice schools and technical or professional schools proper. The apprentice schools are under the direction of the Minister of Public Instruction; trade schools or industrial technical schools, and also the technical high schools, pertain directly to the Ministry of Commerce, although the education department is consulted in respect to their scholastic interests. Commercial education is organized under the direction of the Minister of Public Instruction; but in regard to the higher order of commercial institutions the departments of education and of commerce act conjointly. The courses of training for apprentice schools are based upon those of the elementary primary schools; the industrial and commercial secondary or high schools, in like manner, rest upon the more advanced courses of the higher primary and city schools. Hence these forms of specialized training bear the same relation to the education of the artisan and trading classes as the agricultural schools bear to that of the farming population. In accordance with the purpose of maintaining vital relations between technical schools and the industries to which they pertain, the organized agricultural schools are placed under the Ministry of Agriculture.

Apprentice Schools. — The establishment of apprentice schools is obligatory upon all communities in which there are fifty apprentices working in shops or factories; the masters of trade are also obliged by law to procure the attendance of their apprentices at these schools (Laws of 1872, 1884, 1893). Boys may enter the apprentice schools at twelve years of age after finishing the course of the elementary school. The instruction given in the evening and on holidays occupies seven hours a week, two hours on each of two week days, and three hours on Sundays; the latter are exclusively devoted to drawing. The branches of instruction are (1) the mother tongue, (2) geography, history, and nature study, (3) penmanship, (4) arithmetic and bookkeeping, (5) drawing and sketching. The course is given in detail by the central government. If the religious communities desire to have these apprentices taught religion, they may do so, but they must do it at their own expense. In 1906–1907

Hungary had 465 apprentice (evening and holiday) schools with 83,518 pupils and 3607 teachers; of the entire number of schools fifteen were state schools, 423 district schools, two denominational, and twenty-five belonged to factories and companies. The expenditure for these schools was provided as follows: 437,886 crowns were allotted by the Treasury and from the National Apprentice Fund; 1,241,758 crowns contributed by district authorities and other supporters; thus the total necessary expenses amounted to 1,679,644 crowns ($335,928). In the same year there were ninety-one commercial apprentice schools, of which two were state schools (Fiume and Brasso), sixty-three district, and twenty-six belonging to companies. The total number of pupils was 7160, and the number of teachers, 417. The sum disbursed by parish authorities and companies for the schools was 223,983 crowns.

The commercial courses for women in 1906–1907 numbered twenty-four, of which seven were in Budapest. The pupils numbered 1456, and the expense of the courses, amounting to 141,452 crowns, was met chiefly by tuition fees.

The system of technical schools is crowned by the Polytechnicum at Budapest, and the system of commercial education by four institutions of high standing; namely, the Oriental Commercial Academy, Budapest; a training college for teachers of commercial schools; and two commercial academies, one at Budapest, the other at Kolozsvár. The total expenditures of the Education Department upon trade and commercial instruction in 1907 was 1,450,638 crowns ($290,127).

Secondary Education. — In his project for the reform of education in Hungary Baron Eötvös included the secondary schools; but the time was not favorable for any material change in institutions so deeply rooted in custom and sentiment, and it was not until 1883 that a measure was carried dealing with the system of secondary education. Previous to this time its development had followed the same course in Hungary as in Austria, excepting only for the authorized independence of the schools of the Reformed and Eastern churches, which was exercised mainly in respect to administration and to religious instruction. Many influences, social and professional, conduced to the general adoption of the courses and standards of instruction prescribed by the regulations of 1777 and 1806 (*Ratio educationis*). These regulations prevailed till 1849, when, under the régime of absolutism, the Austrian system was forced upon the public secondary schools of Hungary. The endeavor, during this period, to make German the medium of instruction was partly counteracted in Hungary by the general use of Latin, which accounts for the command of Latin as a spoken language, on the part of educated Hungarians even to the present time. A permanent advantage from the alien influence was the official recognition of modern studies, which was continued after Hungary recovered its autonomy.

The present organization of secondary schools is based upon the law of 1883, the work of August Trefort, Minister of Public Instruction from 1872 to 1888. This law recognizes secondary schools of two orders: classical, represented by the gymnasia; modern, represented by the realschulen. The programs of the two are nearly identical in duration (eight years) and study scheme, with those of the corresponding schools in Austria (*q.v.*). A single difference should be emphasized; namely, the inclusion of both the Hungarian and German languages as compulsory subjects, and the conduct of the final or leaving examination in the Hungarian, requirements applied equally to state and denominational schools. The widespread complaint of the overcrowded programs of the secondary schools led to a revision of the same in 1890 under the direction of Dr. Julius Wlassics, at that time Minister of Public Instruction. Among the changes effected was that of allowing students in the classical schools a choice between Greek and certain specified studies; as a consequence Greek has been dropped in many gymnasia. Notwithstanding this change, the literary requirements are still excessive.

As to the relative standing of the gymnasia and the realschulen, it should be observed that students who pass the final examination of the classical schools may be admitted to any university courses; students from the realschulen are restricted as regards rights of entrance to the polytechnic, the mining, forestry, and agricultural high schools, and to university courses in mathematics and natural science.

The professors of secondary schools must be university graduates who have supplemented their general studies by professional training, and must have successfully passed the government examinations for admission to the service. A seminary and practice school were established at Budapest in 1872, in connection with the university faculty of arts, by Dr. Kármán, who had been a student in Ziller's Seminary at Leipzig, and was thoroughly imbued with the Herbartian spirit. In 1895 a state normal college for secondary teachers was organized at Budapest under the auspices of Minister Wlassics, and this, also, is a center of Herbartian principles. Teachers of secondary schools attain to full appointment after three years' probationary service. At this stage they receive an annual salary of 2000 crowns ($400) in the capital, and 1600 crowns ($320) in the provinces. The teachers under full appointment are divided into two classes. Salaries in the lower class begin at 2600 crowns and rise by periodical increase to 3200 crowns; in the higher classes the salaries increase by successive additions, from 3600 to 4400 crowns. Directors receive from 4800 to 6000 crowns. After thirty years' service teachers and directors may be retired with a pension.

Statistics. — The total number of secondary schools reported in 1906 was 202, of which 170 were classical and thirty-two modern. Of the classical schools thirty-eight were maintained by the State, and of the modern schools twenty-five. The number of secondary students was 68,159, of whom 50,283 were of the Hungarian nationality and 6254 Germans. As regards religious affiliations, the largest contingent, *i.e.* 27,499, were Roman Catholics, and the next largest 14,455, of the Jewish faith. The total number of teachers was 3711. The expenditure for secondary schools in 1906 amounted to 19,347,745 crowns ($3,869,549). Of this amount 3,380,587 crowns ($676,116) were derived from fees; the remainder from public appropriations and endowments. The estimated value of the property of secondary schools is about 90,000,000 crowns ($18,000,000).

High Schools for Girls. — Separate schools and a distinctive type of education for girls mark the Hungarian system. This is illustrated by the arrangement of city schools and by the creation of special high schools for girls. The first of the high schools was established at Budapest in 1875, and the example was soon followed by municipal and church authorities. The course of instruction was based upon the sixth year of the elementary school, and arranged for six additional years. The purpose to maintain high scholastic standards in the new schools was indicated by requiring the same qualifications for the teachers as are required for those of secondary schools for boys. The present organization of the high schools was determined by a ministerial decree of June 12, 1901. The official program comprises the following studies: religion, Hungarian grammar and literature, German, French, psychology and theory of education, history, geography, zoölogy and botany, mineralogy and chemistry, hygiene, housecraft, physics, arithmetic, drawing, calligraphy, needlework, singing (optional from the fifth class upward), physical exercises. Among the optional subjects are the English and Italian languages, taught from the fourth class upwards in two hours a week respectively.

In the year 1895, by the authorization of Dr. Julius Wlassics, young women were admitted to the university, and thus were enabled to devote themselves to philosophical, medical and pharmaceutical callings, with certain restrictions. It was therefore necessary to make arrangements for a course of studies preparing them for the new privileges. For this purpose a course of studies on classical school lines was established at the Budapest High School for Girls during the school year 1897–1898; so that those who were preparing for the university might have special and suitable training, commencing with the fifth class and lasting four years. The Budapest High School has since been transformed into a girls' classical school, and other schools of the same character have been established. Hence the education of girls is now proceeding in two courses: one marked by the predominance of modern languages and domestic science; the other closely assimilated to the classical school for boys. The high schools for girls have mixed faculties of men and women, and their development has created a demand for women teachers having the same qualifications as the professors of secondary schools for boys, receiving the same salaries, and enjoying the same distinction. In 1905–1906 the high schools for girls numbered thirty-two, of which sixteen were state schools. The number of students was 5817, including 1008 boarders. The majority, *i.e.* 5367, were Hungarians. The schools employed 524 teachers, of whom 343 were women. The expenditure for the high schools for girls in 1905–1906 was, in round numbers, 1,970,000 crowns. In the budget of 1907 the State appropriated for this purpose the sum of 1,325,000 crowns ($265,000).

Higher Education. — The Royal Hungarian University of Sciences of Budapest is the chief center of classical and scientific study and research in the kingdom. Its origin is traced to the establishment of a university under the direction of the Jesuits at Nagyszombat in the seventeenth century; it was nationalized in the eighteenth century and transferred from its original home to Budapest. The university of Kolozsvár (Klausenburg) was founded in 1872 by the incorporation of the existing Academy of Law and Institute of Surgery. The Royal Polytechnicum was organized as a university of technical sciences in 1871. The latest official statistics pertaining to these three institutions are presented in the following table: —

State Universities	*Dates of origin and state organization*	*Total students 1911*	*Professors and assistants*	Expenditures		*Vols. in Library*
				Crowns	*United States equivalents*	
Budapest . .	1635 1783	6858	351	3,746,859	$760,612	482,000
Kolozsvár (Klausenburg) . . .	1581 1872	2359	136	1,764,011	358,094	116,090[1]
University of Technical Sciences (Budapest)	1782 1871	1349	155	1,430,846	349,841	90,395

[1] Not including the vols. belonging to the library of the Transylvanian National Museum, with which it is united.

The distribution of university students by faculties and the number of doctors' diplomas conferred in the year of the latest available report, were as follows: —

Faculties	Budapest			Kolozsvár		
	Number of students		*Number of diplomas*	*Number of students*		*Number of diplomas*
	Ordinary	Extraordinary		Ordinary	Extraordinary	
Theology	78	9	6			
Law	3091	152	309	1428		211
Medicine	1258	166	149	202	82	20
Arts	1203	234	74	360	59	18

In the same year the distribution of students by faculties in the technical university and the number of diplomas conferred were as follows: in the department of engineering, number of students, 382; number of diplomas conferred, 106; department of mechanical engineering, students, 587; diplomas, 121; architecture, students, 96; diplomas, 13; general department, students, 8; diplomas, 11.

Among recent events in the history of the University of Budapest, which illustrate both the scope of that institution and the general development of higher education, the following are particularly noteworthy: The expansion of the faculty of law to include political science and the institution of seminars for the promotion of research and practical training. In the medical faculty special courses of training for pharmacists and school doctors have been established. In 1889 the Pasteur Institute and Hospital was established. The faculty of arts from its foundation served as a preparatory course for students of the other faculties, and it has become also a center of training for teachers of secondary schools and an examination board for candidates aspiring to that service. Since 1885 the faculty of arts has comprised seminars which are partly for the training of teachers, partly for the purpose of initiating students into the methods of research. The faculty can boast of five seminars, those of classics, modern philology, history, geography, and mathematics. By a royal decree of Nov. 18, 1895, women were admitted as undergraduates of universities and university colleges in order that they might be prepared as teachers, doctors, and chemists. Permission is given to women students in each case after a statement has been made by the university or college in question: and diplomas are issued to them after a successful completion of the prescribed university career. In addition to these two universities, the Minister of Education announced (1912) a bill to provide for the establishment of two new universities at Pressburg and Debreczin, only the former to include a medical school. A royal academy has existed at Pressburg since 1794, with a faculty of law and political science and courses in philosophy. At Debreczin a Reformed Higher Institution (*Hochschule*) was established in 1549 and now has theological, legal, and philosophical faculties with 277 students in 1910.

The Baron Joseph Eötvös College is a unique institution at Budapest, the object of which is to give deserving students of the Budapest University, who intend to enter the teaching profession, an opportunity for holding social intercourse with their fellows and of acquiring the necessary theoretical and practical knowledge to qualify them for their work. The college is directly subordinate to the Minister of Public Instruction, who delegates his authority to the curator. For the expert guidance of the resident students four tutors (chosen by the curator from among the teachers in the service of the State) are appointed by the Minister (for periods of three years in rotation) for special duties. They are present in the college during the hours devoted to private study, to give individual or combined instruction to the candidates, and, as occasion arises, to hold special courses of lectures.

Higher education in Hungary includes, further, independent colleges of theology maintained by the various religious denominations; and colleges of law. The schools of midwifery were raised to the rank of state professional schools by regulations of 1873, and placed under the control of the Minister of Public Instruction. The Royal Hungarian College of Mining and Forestry, under the direction of the Minister of Finance and the Minister of Agriculture, makes provision for the scientific education of surveyors of mines, surveyors of smelting works, and surveyors of forestry. It was attended in 1907 by 355 students, 117 in the mining department; 238 in the forestry department. Students are admitted by competitive examination, and those who fail to satisfy the rigid requirements for promotion during the four years' course are eliminated. Tuition is free; the purpose of the school is to secure a body of highly trained experts for the state service of mining and forestry. In addition to the liberal support of higher education, the State contributes to the maintenance of the schools of painting and sculpture and the conservatories of music, which preserve from age to age the distinctive traits of national art. The following art institutions are under the immediate direction of the Minister of Public Instruction, and receive liberal appropriations annually from the State. The Royal Hungarian College of Art is both a school for the training of teachers of drawing and for the development of independent artists; the students for 1907 numbered 347, of whom ninety were women; the State grant for the year was 183,080 crowns ($36,616). A special school of painting for women was established in 1885 under the auspices of the ministry. The annual appropriation for the school is about 21,000 crowns (= $4200). The National Academy of Music is entirely supported by the State at an annual expenditure of about 230,000 crowns ($46,000). The Theatrical School was opened in 1863 in connection with the National Theater, and in 1873 was put under the charge of the Minister of Public Instruction. The age for admission to the school is sixteen for women and eighteen for men, and only such pupils are retained as show decided dramatic talent. The diploma of the school admits the recipient to membership in the National Association of Actors. In 1907 the State appropriated 82,000 crowns ($16,400) for the current expenses of the institution. A. T. S.

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HUNT, MARY HANCHETT (1831–1906). — Temperance educator; was educated at the Palapsco Institute, Maryland, and was for several years instructor of chemistry there. She was the leader of the movement that made temperance physiology a compulsory part of the school instruction in the United States. She was the author of thirty textbooks on temperance physiology. W. S. M.

See Temperance Instruction in Schools.

HUNTINGTON, FREDERIC DAN (1819–1904). — Educational writer; was graduated from Amherst College in 1839, and later took a course at the Cambridge Divinity School. He was for five years (1855–1860) a professor in Harvard College; but most of his life was given to the ministry of the Episcopal Church. His *Unconscious Tuition*, published originally in 1856, was a notable contribution to the literature of education, and is still widely read. W. S. M.

HURON COLLEGE, HURON, S.D. — A coeducational institution established by the Presbyterian Synod in 1883 at Pierre as Pierre University; the title and location were changed in 1898. Academic, collegiate, commercial, music, and elocution departments are maintained. The entrance requirements are equivalent to sixteen points of high school work. The degrees of A.B. and B.S. are granted on the completion of appropriate courses. The faculty consists of twenty-four members.

HUTCHESON EDUCATIONAL TRUST, GLASGOW, SCOTLAND. — An endowment left by George Hutcheson (1550–1639) and Thomas Hutcheson (1589–1641), public writers and notaries of Glasgow, and now devoted largely to educational purposes. George Hutcheson left a tenement of land for the building of "one perfyte hospital for entertainment of the poor, aged, decrepit men to be maintained therein," and for its maintenance added bonds of the value of about $12,000. Thomas Hutcheson supplemented this by a sum equal to about £600, and for himself gave bonds amounting to about £12,000 for founding in connection with the hospital "a commodious and distinct house of itself for educating and harboring twelve male children, indigent orphans, or others of the like condition and quality, sons of burgesses." In 1821 a Royal Charter was obtained. The scope and purpose of the endowment was extended, as in the case of many similar endowments in Scotland, for educational purposes. In 1876 the school was extended and a new school was added for girls, both schools being called Hutchesons' Grammar School. Moderate fees are charged and a limited number of free foundationers are admitted.

See Hospital Schools.

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HUTCHINS, JOSEPH (1747–1833). —Textbook author and college professor; was graduated from the University of Pennsylvania in 1765, and was for many years professor in Franklin College. His *First Principles of English Grammar* (1790) antedated the textbook by Lindley Murray (*q.v.*) by five years. W. S. M.

HUTTEN, ULRICH VON (1488–1523). — German humanist and reformer. Of an erratic and unstable character, living generally on the generosity of patrons of learning, Ulrich von Hutten won the admiration and friendship of many of the humanists whose center was at Erfurt. Hutten's chief works were the *De Arte Versificandi, Liber unus* (1510), which gives the rules of Latin prosody in 422 hexameters; patriotic poems addressed to Emperor Maximilian, who gave him the laureate crown in 1517; orations against Ulrich, duke of Württemberg, who had murdered a relative of Hutten; and in the last stage of his career, when he joined the cause of the Reformation, prose writings and poems in the vernacular, in which he was as successful as with Latin. Hutten is credited with an important part in the publication of the *Epistolæ Virorum Obscurorum* (*q.v.*). It is now well established that in the first part of the letters Hutten had no share whatever, but he was probably the chief author of the second part which appeared in 1517. A man of strong impulses and considerable ability, Ulrich von Hutten threw himself as enthusiastically into the fight for liberal culture as into the cause of political and religious freedom.

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HUXLEY, THOMAS HENRY (1825–1895). — Scientist, educational thinker, and social reformer, was born at Ealing, near London, May 4, 1825, the son of a secondary schoolmaster. Briefly educated at Dr. Nicholas's school in Ealing, where his father was a teacher till 1835, Huxley showed an early turn for metaphysics and for scientific inquiry. The lad's real education came through private reading, conversation, and intimacy with older people. Anatomical studies and Carlyle's writings on philosophy and history deeply influenced Huxley during adolescence. Admiration for Carlyle impelled him to acquire a knowledge of the German language subsequently invaluable to him as a scientific thinker. In 1841 he went, a boy of seventeen, as assistant to a medical man, Mr. Chandler, in Rotherhithe. Among the population surrounding the London docks, he came face to face with the grimmest aspect of the social problem, and throughout life was a zealous reformer of social conditions, holding firmly to the middle way between repressive collectivism and crippling *laissez-faire*. Studies at Charing Cross Hospital (especially under Wharton Jones) completed his medical training, during which he won brilliant distinction at the London University. In 1846 he was appointed assistant surgeon to H.M.S. *Rattlesnake*, a frigate sent out by the British Admiralty on an exploring expedition to New Guinea. Thus Huxley, like his intimate friends, Charles Darwin (*q.v.*) and Joseph Dalton Hooker, began his scientific career on board a ship of the British Navy. His work on the *Rattlesnake* established Huxley's scientific position. On his return to London in 1851 (aged twenty-six) he was elected Fellow of the Royal Society, becoming a member of its Council and receiving its Royal Medal in 1852. But pure science was long in bringing Huxley pecuniary preferment. In 1852 he, like his friend Tyndall (*q.v.*), was an unsuccessful candidate for a professorship at the University of Toronto. The death of his mother, and his father's illness, in 1852, combined with his own failure to find a suitable post, brought him nearly to despair. He was on the brink of giving up science and of emigrating to Sydney as doctor or squatter. In 1854 the tide turned. He was appointed lecturer in the Government School of Mines in Jermyn Street, London, and entrusted with coast survey investigations under the Geological Survey, to which he became naturalist in 1855. He also was appointed lecturer on comparative anatomy at St. Thomas' Hospital. Now established, he rapidly rose to eminence in the scientific world.

A characteristic of Huxley's writing was his intimacy with the best current scientific thought in France and Germany. No earlier English scientific writer had shown the same European knowledge. Huxley was one of the few who were initiated by Darwin into the argument of the *Origin of Species* before the publication of the book, which was submitted to the judgment of Huxley, Lyell, and Hooker. In Darwin's words, he acted as the latter's "general agent." His famous reply to Bishop Wilberforce at the Oxford Meeting of the British Association in 1860 gave him national fame. In 1862 Huxley began his scientific lectures to working men. No one did so much to secure public acceptance for the thesis of natural selection.

Huxley as a teacher was magnetic. His students found his intense love for science infectious and his lectures memorable. As Dean of the Royal College of Science, London, he introduced changes of organization which are of historical importance from the point of view of educational method.

Huxley showed an untiring interest in questions of education. In 1854 he delivered at St. Martin's Hall, London, an address on the *Educational Value of the Natural History Sciences*, urging that biology demands a prominent place in any worthy scheme of education. In 1865 he supported the scheme for a group of international colleges (to be established in England, France, and Germany, so that a boy could in turn acquire a sound knowledge of all three languages while continuing the same course of education), which had been put forward by Dr. Leonhard Schmitz and Richard Cobden, but was fatally interrupted by the Franco-German war of 1870. At the same period he supported Dean Farrar's (*q.v.*) proposals for the introduction of scientific teaching into the great Public Schools. In 1866 he published *Lessons on Elementary Physiology*, a textbook which had great formative influence upon later educational manuals. In 1868 he addressed the South London Working Men's Club on *A Liberal Education and Where to Find It*.

In 1870 Huxley published the *Lay Sermons*, a model of style in the accurate popularization of scientific thought. In the same year (the Elementary Education Act having just been passed) he wrote a powerful essay on *The School Boards; What They Can Do and What They May Do*. He was elected a member of the first London School Board, and had an almost determinative influence both in planning the course of study and in the retention of the Bible in the curriculum. He advocated infant schools, continuation schools, technical education, and " an educational ladder from the gutter to the University." The first elements of physical science were to be taught in the schools. " There is no form of knowledge or instruction in which children take a greater interest." Girls were to be taught the elements of household work and of domestic economy. Physical training and drill were to be part of the regular business of every school. Drawing and music, as civilizing arts, were also to find a place in every course of training. History, except the most elementary notions of it, he regarded as too advanced for children of elementary school age. He declared himself "in favor of reading the Bible, with such grammatical, geographical, and historical explanations by a lay teacher as may be needful, with rigid exclusion of any further theological teaching than that contained in the Bible itself." But Huxley was strongly opposed to any teaching of religious formularies, *e.g.* even the doctrine of the Trinity, in elementary schools aided from public funds.

Huxley became secretary of the Royal Society in 1871 and president in 1880. In 1881 he declined the Linacre Professorship of Physiology at Oxford and to be nominated for the mastership of University College, Oxford. He refused all titular honors from the State, except a Privy Councilorship in 1892. The latter he accepted because, though incidentally carrying a title, " it was an office, in virtue of which a man of science might, in theory at least, be called upon to act as responsible adviser to the Government should occasion arise." His connection with the Science and Art Department from 1854 to 1890 was intimate and loyal. Of the good which that department did in stimulating scientific study and teaching he was one of the chief authors. But he was not blind to the defects of the system, payment by results, which he accepted as the best practicable plan. From 1877 onwards, Huxley was an ardent and powerful advocate of technical education. The great address given at Manchester in 1887 is a *locus classicus* of contemporary English thought on the subject.

But he was out of sympathy with modern developments of English thought as to the relation between the State and secondary education, holding that, while social welfare justifies a system of compulsory elementary education with a rich curriculum, beyond that individuals must be left to rise through innate capacity, rather than be lifted by state help into places for which they may have no real qualification.

Since Thomas Arnold, Huxley was perhaps the most powerful personality in English education. Brave as a paladin, absolutely fearless and disinterested, profoundly learned, affectionate, humorous, tender, artistic; at heart intensely religious, but the implacable foe of dogmas in which he did not believe and of ecclesiastical authority which he distrusted or denied, he represented at its best a transitional phase in English speculation and practice in the sphere of ethics and politics. Throughout his life he was a great antiseptic influence in English thought upon education and the functions of the State. M. E. S.

For portrait, see p. 621.

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HYGIENE. — Hygiene (from ὑγιεία, hygiene, health) is usually defined as the science that treats of the prevention of disease and the preservation of health. It is especially an applied science, and, in a certain sense, an art. It aims, in the words of a modern writer, " to make growth more perfect, life more vigorous, decay less rapid, death more remote." The positive note in this definition of aims is characteristic of recent hygiene. It is no longer satisfied with the mere attempt to prevent disease, but it emphasizes especially the need of normal healthful development and the acquisition of vigorous habits of health that shall be prophylactic against disease.

The scientific study of hygiene is recent. The attempt to practice hygiene is very old. The art of hygiene is supposed to have begun with the ancient Egyptians; and a crude mass of folk traditions representing more or less clearly the experience and superstitions of the race in regard to the preservation of health has come down to us. On account of the recency of the scientific study, a vast amount of error is mingled with the truths of experience that have survived. But while the scientific method as applied especially to hygiene is recent, and the results are still so meager that some investigators call it the science of the future, nevertheless the same ideals and the same methods are employed here as in other parts of the field of science; and here as elsewhere the most rigorous scientific experimentation under controlled conditions and with verification of results is demanded.

The subject of hygiene naturally divides into personal and public hygiene. Hygiene in a broad sense includes also the study of conditions that favor the healthful development of the human species (eugenics); the conditions affecting the health, preservation, and development of special races (racial hygiene); and the conditions that favor the healthful development of human society (social hygiene).

Public hygiene has many divisions: on the one hand, sanitation as regards soil, water, food, air, cleanliness in general, protection from disease, care of the dead, the defective, the feeble-minded, etc.; and on the other hand, the hygiene of occupations — military hygiene, naval hygiene, the hygiene of factories, etc. An introduction to the subject of public hygiene is given by such American textbooks as those of Bergey, Harrington, and Sedgwick, and the scope of it is shown by Weyl's great handbook. Among these various departments of public hygiene none is more important than child hygiene and school hygiene, and the whole field should interest teachers. These subjects and personal hygiene are treated below in special articles. W. H. B.

See EUGENICS; HYGIENE, PERSONAL; HYGIENE, SCHOOL; HYGIENE, TEACHING OF.

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HYGIENE OF GRADING. — See GRADING, HYGIENE OF.

HYGIENE OF INSTRUCTION. — See HYGIENE, SCHOOL.

HYGIENE, PERSONAL. — Personal hygiene consists of two important parts, somatic hygiene and mental hygiene. On account of the great individual differences in strength, endurance, ability to work and to resist disease, the problem in both these fields must be an individual one. The solution is of vital importance, especially for the teacher, not only for the preservation of the teacher's own health, but for the right performance of one's professional work and to enable one to set a proper example before one's pupils. Mental hygiene is quite as important for the teacher as somatic hygiene, and the teachings of mental hygiene and the hygiene of instruction are so important for sound education that for pedagogical as well as hygienic reasons the teacher cannot ignore them.

The subject has also important social aspects. In its wider sense personal hygiene is the very basis of disease prevention and health preservation. All plans for community or national freedom from disease must rest upon and depend upon the care with which the individual members of society settle their problems in personal hygiene. If every member of any given social unit would persistently apply his rights of franchise in favor of more stringent and effective laws of hygiene and sanitation, the problems of personal hygiene would be far easier. The difficulties of personal health control are largely difficulties which are of a community origin. The transgressions of one member of a community are visited upon the lives of his innocent fellow citizens. Equity in matters of this kind is secured only through law backed by strong popular sentiment. Then, if every member of any given social unit is protected from hygienic or sanitary injury inflicted by his fellow citizens, he may organize his policy of personal health control with every prospect of success. Under such circumstances it would be possible to develop a community in which each member practiced intelligent habits of bodily nourishment, supervising the food he would eat, the food he would drink, and the food he would breathe; intelligent habits of excretion; intelligent habits of exercise; intelligent habits of rest; and intelligent habits of cleanliness. Men of such habits are men of health, men of strength, men of efficiency. A community or a nation with such habits would have solved the problem of prevention of disease and have conserved its resources in terms of human life, human happiness, and human prosperity, with all that such conservation means economically, socially, and politically.

Another very important relationship of personal hygiene is its relationship to intellectual efficiency. The uncorrected, incapacitating, remediable physical defects of school children; the time lost through absences due to preventable disease; the paralyses and other organic degenerations following the preventable diseases and leaving chronic incurable conditions obstructive of further mental development and destructive of that already attained; the disturbed home conditions producing nervous strain, poverty, undernourishment, and lowered resistance, following parental disease or death; are all samples of serious avoidable and preventable conditions affecting the intellectual activities of school children. If the personal hygiene of school children and the personal hygiene of the communities in which they live were what they ideally ought to be and what they could be, these destructive conditions could not exist.

Furthermore, the aggressively healthy child is the most efficient child academically as well as physically considered, The teacher that is working with sound healthy minds will secure larger educational results than under less normal conditions. This fact is effectively proven by the experiences of our open-air schools; the introduction of school lunches; the progress of pupils who have been relieved of incapacitating physical defects; and the studies of men who have compared schools and school children representing various types of physiological health.

The Scope of Personal Hygiene. — In its narrower sense, personal hygiene has been construed as including only those physiological and anatomical and very intimate personal relationships and habits which are obviously personal. Such a conception would bring the following topics under the heading of "Personal Hygiene": Care of the clothing, skin, scalp, nails, eyes, ears, nose, teeth, mouth, throat, heart, lungs, alimentary canal, genito-urinary organs, bones, joints, brain and nervous system, food, water, ventilation, tea, coffee, alcohol, and tobacco. In some texts "first aid to the injured" (*q.v.*) is included.

A wider construction of the scope of personal hygiene includes everything that bears upon the health of the human body. (See Hygiene, Teaching of.) Such a scope would include the various subtopics connected directly and indirectly with the following subjects: Bodily nourishment, including food, water, and air; the excretions; exercise; rest; the influence of abnormal conditions on health (*e.g.* defective vision, bad teeth, adenoids, constipation); the influence of certain habits on health (*e.g.* rapid eating, bad habits of vision, smoking, drug habits, sexual habits, etc.); the causes of disease; the carriers of disease; our defenses against disease; and the nature of our common diseases.

Personal hygiene considered from this point of view would be rational and comprehensive. Its relationship to sex hygiene (*q.v.*) domestic hygiene, school hygiene, medical inspection (*q.v.*), school nursing, community hygiene, industrial hygiene, military, naval, and national hygiene is obvious. These special divisions of hygiene are important because they represent personal hygiene under special conditions. The hygiene of all society and of all the enterprises of society depends upon the hygiene of the individual. On the other hand, the individual is more than powerless unless society as a whole stands for such regulations and such customs as will make possible, easy, and practical the application of the laws of health.

T. A. S. and W. H. B.

For methods of instruction and content of the subject see Hygiene, Teaching of.

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HYGIENE, SCHOOL. — School hygiene, one of the most important departments of public hygiene, is concerned with the conditions of health in the schoolroom and the sanitation of the school surroundings. During the last fifty years the scientific method has been more and more employed in this field, and a solid nucleus of scientific fact has been collected. A rich literature has been contributed in the form of articles not only in the special periodicals devoted to the subject, in reports, proceedings of societies, and the like, but in the archives of Hygiene, of Medicine, Physics, Psychology, Anthropology, and even in those of Architecture and Engineering, as well as in the educational journals. The three large German handbooks, by Baginsky and Janke, Burgerstein and Netolitzky, and Eulenberg and Bach, show the scope of the work already done; and the little textbooks by Shaw, Kotelmann, and others, furnish convenient compends of the elementary facts and principles.

The history of the development of the subject is interesting, but can be briefly told. The ancient Greeks, with their emphasis upon physical training in early education and the important treatises by Philostratus, Lucian, and Oribasius, were pioneers in school hygiene. While in the Middle Ages hygiene was largely ignored by writers and teachers, with the Renaissance came a new interest in health and physical development. Vittorino made play and hardy nurture a prominent feature in his school. Luther emphasized the need of physical exercise. Comenius insisted on spacious classrooms, playgrounds, physical training, sound health as a condition of a sound mind, and the adaptation of instruction to the pupil's stage of development. The Jesuits practiced hygiene in their schools, and the reformers like Locke, Rousseau, and Basedow preached it. School hygiene in the modern sense began with the founders of gymnastics, — Guts Muths, Jahn, and Ling, — and with the work of physicians like Frank and Lorinser, and was placed upon a solid foundation by the special studies of a long line of investigators from Lang, Zwez, Fahrner, Von Pettenkoffer, Cohn, and Barnard, down to the present time.

School hygiene draws its facts from many sources, and naturally it overlaps other related subjects, such as general hygiene, sanitary engineering, medicine, child hygiene, etc. The subject naturally divides into three parts — the construction and sanitation of the schoolhouse, the hygiene of the school child, and the hygiene of instruction. All of these are, of course, ultimately concerned with the health of the child, but the classification is a convenient one. The aim of all of these is positive, the development in the school child of habits of healthful activity. Especially and directly is this true of the last two divisions — the hygiene of the school child and the hygiene of instruction.

Hygiene of the School Child. — Child hygiene in an important sense is a special subject because the child's body differs from that of the adult. The hygiene of the school child demands special consideration because of the special work required in the school. It is based upon the character of the child's body and the laws of growth, and it seeks to determine the needs and to avoid the dangers of each stage of development. Hence among the important contributions to school hygiene in the last twenty-five years have been many scientific studies of growth and development, of the diseases and abnormalities of school children, and of the defects of the various sense organs. Thus the relation of physical development to intelligence, the incidence of disease by years, by grades, by seasons, by months of the school year, the relation of defects to school progress, etc. Methods of detecting and controlling contagious diseases have been investigated, and certain important correlations have already been established By the introduction of health inspection into the public schools in recent years not only is the importance of school hygiene emphasized, but a large amount of valuable material for the study of the subject is being collected. The school should be made the most important factor in public hygiene; for in it practically all the children are collected, and conditions can be controlled in the interests of health. The prime importance of this part of school hygiene for the teacher is obvious. (See CONTAGIOUS DISEASES; EAR; EXCLUSION FROM SCHOOL; EYE; MEDICAL INSPECTION, etc.)

Hygiene of Instruction. — While this department of school hygiene may be said to have begun with the Greeks and been treated by Comenius, it has been developed only in recent years. It is now so important, however, that Burgerstein devotes some four hundred pages to it in the second edition of his handbook, and each year brings important new contributions. It emphasizes the hygienic importance of the mental habits formed by education and of the secondary effects of instruction, and it studies every educational principle and method and the matter of instruction from the point of view of hygiene. Thus each subject of instruction is considered with regard to the effect of the discipline on health. (See articles on the Hygiene of ARITHMETIC, READING, DRAWING, SPELLING, SINGING, etc.)

The many problems concerned with the period of study — fatigue, the best alternation of periods of work and rest, the length of the school day, one session or two, recesses, pauses, etc. — have all been made the subject of scientific investigation. The importance of this newer field of school hygiene is seen when one considers the fact that an important means of curing nervous and mental disorder is reeducation, the development of healthful habits of mental activity — wholesome interests, habits of attention, self-control, and orderly association — in fact, the very habits that are essential for hygienic school work. And when one further reflects that the inmates of such institutions were a few years ago pupils in the public schools, the advantage of developing such habits as prophylactic against nervous and mental breakdown is obvious. More and more scientific investigation and observation are showing the hygienic importance of such mental training; and the hygiene of instruction has become of vital significance to the teacher.

The Construction, Equipment, and Sanitation of the Schoolhouse. — First of all the sanitary surroundings of the schoolhouse have been made the subject of investigation. The schoolroom is a workshop. The conditions must be made hygienic for the work to be done in it. The work required is performed chiefly by the brain, by the eye, and ear, and by the hand under the control of the eye and the brain. Thus the conditions necessary are not merely the avoidance of whatever would be injurious, — a stagnant, poisonous, arid, or overheated atmosphere, too intense light, glare from surrounding buildings, noisy occupations, unsuitable rooms, etc.; but in every way the optimum conditions for such work — especially abundant and properly regulated light and an ample supply of oxygen. So important is the condition last mentioned both for the health of the pupils and the work to be done that the desirability of schools out of doors, or in conditions approximating those out of doors, is now being emphasized. Since in most parts of the country, however, a large amount of indoor work seems necessary on account of inclement weather, it is becoming more and more important to provide hygienic conditions in the schoolroom.

Thus this department of school hygiene is concerned first of all with the optimum conditions for a workshop where the laborers are growing children and the labor brain work. Architectural and artistic considerations are important, but secondary. First of all must be considered the health of the workers. For example, the unit in a schoolhouse is the schoolroom, and the size of the room should be determined by consideration of the average limits of normal sight and hearing; and the problem of construction is that of grouping a sufficient number of such units in a schoolhouse in a convenient way to give suitable light, air, etc. Many scientific studies have been made of the best forms of construction, and of methods of heating, ventilation, lighting, etc.; and from these and the experience in building millions of schoolhouses certain definite norms for construction have been established. If we could bring together into one schoolhouse all the good features that are actually incorporated in various schoolhouses throughout the country, features which actual experience has shown to be of practical utility, we should have a model schoolhouse. Most schoolhouses, however, are seriously defective in certain aspects, and some apparently ignore modern hygiene altogether.

W. H. B.

See articles on Architecture, School; Heating; Ventilation; Lighting, etc.

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HYGIENE, SOCIAL. — See Sex Hygiene.

HYGIENE, TEACHING OF. — The importance of the teaching of hygiene can hardly be overestimated. Health represents a universal human interest. Its importance can be estimated only in terms of human value. Efficiency, to adopt the modern slogan, is impossible without it. Both directly as contributing to personal well-being and indirectly as contributing to the welfare of others, health is a prime condition of human happiness and even of morality. Such truths, which are so commonplace as to be merely platitudes, should not only be taught to the young, but should be made vital by training. Hence the aim of education from the point of view of hygiene is the development of habits of healthful activity both physical and mental. This training in habits of health should be supplemented by suitable instruction at different grades. To insure such training and such instruction, an adequate course in hygiene and proper training are imperative in the preparation of all teachers. This is the consensus of hygienists, and a resolution to emphasize this need was passed by the Second International Congress of School Hygiene at London, 1907.

Instruction in Hygiene in the Schools. — The extent to which instruction in the principles and practice of hygiene has been introduced into the schools of the United States is indicated by the recent investigations of the American School Hygiene Association. Meylan reported on 116 colleges, of which 75 per cent were giving instruction in hygiene. Twenty-six per cent of the colleges reporting on the details of their work were giving instruction in personal hygiene only; 24 per cent were giving instruction in general hygiene; others reported in smaller percentages that instruction is being given in emergencies, community hygiene, industrial hygiene, and mental hygiene. Seventy-nine per cent of these colleges reported that students were required to undergo a medical examination before taking up their work. Seventy-nine per cent reported regular sanitary inspections of school buildings and dormitories; 77 per cent inspected kitchens; 83 per cent inspected the water supply and grounds. Twenty per cent of these colleges accepted hygiene as a credit for admission.

Gulick reported on 90 public normal schools and on 2392 public high schools. Seventy-four per cent of the normal schools and 16 per cent of the high schools were giving instruction in hygiene. At the last Congress of the American School Hygiene Association, Gulick reported on 758 cities having graded public school systems. He found that 45 per cent of those cities "have regular organized systems of medical inspection in their schools" and "about one quarter of the cities have systems under the Board of Health" and three quarters are under the Board of Education. "Only a little more than one half of them undertake physical examinations." Seventy-six of those cities were employing school nurses, and forty-eight, school dentists. (See MEDICAL INSPECTION.) Twenty-five per cent of those cities were using individual drinking cups, and 75 per cent had sanitary drinking fountains. (In some of the cities both systems were in use.) "Over one half of these schools use moist cloths for dusting; in nearly all of them dust-absorbing compounds are used in sweeping; and in nearly a tenth of them the schools are supplied with vacuum cleaners." Most of these cities reported that their schoolroom floors were washed once in a month or once in three months, "although it is by no means rare to find cities in which they are washed once in five months or never washed at all." Adjustable desks are reported in about one half of the cities heard from. "Ninety-five per cent of the cities teach their children the effects of alcohol and tobacco; 61 per cent have special courses on the prevention and cure of tuberculosis, and 48 per cent give lessons in first aid." It is very evident from these reports that a large number of the larger cities in the United States have made provision for instruction in the principles of hygiene and have organized systems of medical and hygienic supervision which must be more or less effective in establishing the practice of hygiene.

Europe, Canada, Australia, New Zealand, Japan, China, Mexico, and Argentina are reported as having plans for various improvements in school hygiene. Medical inspection, school nurses, open air schools, school lunches, school dental clinics are being reported from the larger cities all over the world. On the other hand, little is being said about the introduction of hygiene into the curricula of the schools. It is difficult to introduce a new subject into the school curriculum. School curricula everywhere are already overcrowded, and it has been difficult to secure time and opportunity for the instruction of pupils in the principles and practice of hygiene in the primary and secondary schools. France has provided some instruction in her primary schools. The teacher gives this very elementary instruction as a minor part of his regular work. The higher schools have more advanced instruction given by the teacher or professor of natural history. The English Parliament (May, 1911), considered a bill "to require that in public elementary schools instruction shall be given in hygiene and to girls in the care and feeding of infants," and the Education Board issued syllabuses on these subjects. The status of instruction in hygiene in the secondary schools of the British Isles was stated by C. E. Shelly at the International Congress on School Hygiene, London, 1907 (see *Proceedings*, p. 919) as follows: "It cannot be said that hygiene has any existence as a recognized subject of instruction in the Secondary Schools of this country with the exception of a certain number of training schools for teachers." No instruction in hygiene is required by law in Russia. The instruction that is given is given voluntarily, and is optional. The same condition is general throughout Europe. Attempts have been made in Germany to provide school instruction in sex hygiene (*q.v.*). At last reports the authorities repressed the effort. Austria is at present giving such instruction in connection with anatomy to pupils in the preparatory schools. This plan has been in operation three years. It is reported that recently this instruction has been extended to the lower Austrian schools so that pupils who leave at the age of fourteen years will have had its benefit.

Scope of a Course in Hygiene. — Authorities differ as to the proper content of a course in the principles of hygiene. The older texts combined a study of anatomy and physiology with a study of the influences that act injuriously upon the organs and therefore upon their physiological activities. Some of the later texts minimize the amount of anatomy and physiology presented and emphasize the presentation of more purely hygienic material.

Leaving out of consideration the essential value of an intelligent knowledge of the main facts of human anatomy and physiology, there remain obviously very strong reasons why an intelligent knowledge of hygiene is impossible without an equally intelligent knowledge of anatomy and physiology. The teacher must be well informed in these fundamentals, for he cannot afford to be ignorant of the basis of his subject. The pupil must necessarily be content to take many things for granted, but his hygienic education will be more valuable in the proportion in which it is based on a real knowledge of its scientific basis. The amount of time necessary to give an adequate knowledge of physiology and anatomy will depend on whether or not physiology is taught elsewhere in the curriculum as well as on the age of the pupil and on the phase of hygiene under consideration.

There are different points of view also concerning the content of elementary, intermediate, and advanced courses in their relation to each other. A common plan is to consider the same subject matter year after year, going more deeply into the details each time. The opposing plan is to take up new phases of hygiene each term, utilizing at the same time the facts already presented. Another variation in the conception of the proper content of a course in hygiene is that which includes procedures calculated to develop the practice of hygiene. Habit is most important. We must have the knowledge, but the knowledge is of little use if it is not applied in the daily habits of the individual. The procedures that tend to develop habits of hygiene are physical exercise (games, sports, plays), swimming bathing, tooth-brush drills, hygienic and medical inspection with the correction of bad habits of hygiene and of remediable incapacitating physical defects, routine exclusions for contagious cases and cases exposed to contagious disease. This conception combines instruction in the principles of hygiene with instruction in the practices of hygiene. It unites classroom instruction with the applications of hygiene in the various departments and divisions of the school.

It is most desirable from the standpoint of educational method and effective results to combine the essentials of related anatomy and physiology with a carefully graded sequence of hygienic subjects; at the same time insisting on the practice of health habits and procedures from those of simple cleanliness and exercise up to those of individual relief from the handicap of physical defect and those of community protection against communicable disease.

Methods of Instruction in Hygiene. — There is the same necessity for sound educational methods in presenting the subject of hygiene to school children or college students as there is in the presentation of any other subject taught them. The object of this instruction in hygiene is the establishment of right habits of living based upon a rational knowledge of the reasons why those habits are right. The subject is essentially scientific in its foundations and logical in its application. All the arguments that have been advanced in support of better educational methods of teaching scientific subjects and all the arguments that have been advanced in support of educational methods that will best develop the power of reasoning are arguments in favor of the employment of the best educational methods in the teaching of hygiene. The subjects which are basal to hygiene, such as physiology, anatomy, and bacteriology, should be taught by the methods that have been found most effective for those subjects. The need for dissections, models, illustrations, diagrams, charts, specimens gross and histologic, and clay molding in anatomy; of illustrations, references, laboratory experiments, and so on in physiology; of cultures, experiments, and specimens in bacteriology is as important when these subjects are a part of a course in hygiene as they are when they are independent.

The curricula of our schools are already overcrowded. The addition of hygiene as a complete subject means a large addition. For these reasons there are very few schools in which hygiene is presented in anything like its complete form. The commonest school method is that which utilizes a selected textbook from which the pupils prepare their recitations. Charts, diagrams, illustrations, and practical questions accompany the recitations. Where departments of biology exist, or where physiology or bacteriology is taught, these subjects are often made to cover hygiene or various parts of it. Many of our high schools and colleges are placing hygiene in the Department of Physical Education, where it has a peculiar appropriateness. A good deal of hygiene is taught by the medical inspectors and nurses in some of those schools that have an efficient system of medical inspection.

Teaching of Hygiene in the Primary Grades. — The young child on entering school brings with him the habits of hygiene which have been taught him at home. If his mother has taught him good habits of eating, good habits of excretion, good habits of bathing, good habits of exercise, and good habits of rest, the problem of his hygienic instruction during his elementary years in school is much simplified. In fact he has already received a quality of instruction which from the standpoint of his physiological well-being and efficiency will never be surpassed at any other time in his life. As a rule, however, the young child on entering school, particularly the city child, is in need of more or less forceful instruction in the habits of hygiene, and has a faulty knowledge of even the simpler principles of hygiene. The individual need for and the character of instruction must be determined by the teacher or authorities in charge. It is obvious that such matters as cleanliness of the body and wearing apparel, care of the teeth, eyes, ears, nose, hair, and nails, habits of play, excretion, and posture, will figure prominently in this early instruction. The teacher will have profitable recourse to informal talks, personal talks, and the use of simple charts, pictures, diagrams. There should be hygienic and medical examinations supported by a requirement that reasonable hygienic and medical advice must be respected. This combined instruction in principles and practices of hygiene will tend even at a very early age to establish principles and practices in the thoughts and acts of the child.

The Teaching of Hygiene in the Grades and in the High School. — Throughout the later work in the grades and in the high school there should be the same careful correlation between the instruction in the principles of hygiene on the one hand and the procedures and conditions of applied hygiene and sanitation on the other hand as they exist in the school system, its buildings, grounds, and material equipment. The educational influences from these various sources should be harmonious. There should be no inconsistencies between general scientific hygienic principle and local hygienic practice. The subject matter in any given course in hygiene should include particularly the hygienic features connected with the health problems which occur in the daily lives of the individuals concerned. Such a course would logically include the following topics: Food; its physiological importance and requirements; its source; its contaminations; its preparation; its ingestion; the influences of emotional states on its digestion; its assimilation and its excretion. Water; its physiological importance; its contamination. Air; its physiological importance; its contaminations; its alterations under various meteorological conditions; ventilation. The excretions; their physiological significance; care of the bowels; the kidneys; the skin; the lungs. Physical exercise; its importance; its necessity; its varieties; its abuse. Rest; mental and physical rest; relative rest and recreation; sleep. The influence of abnormal conditions on health; *e.g.* defective vision; obstructed breathing; adenoids; tonsils; defective and unclean teeth; diseased gums; sluggish ulcers, wounds and old areas of irritation; exposures to heat, to cold, to moisture and to drafts; fatigue. The effects of bad habits on health; *e.g.* rapid eating; mouth breathing; unwise use of the eyes; sex habits; the abuse of tea, coffee, alcohol and tobacco; opium and cocaine habits. The causes of disease, such as pathogenic bacteria and other parasites. The carriers of disease, such as the fly, the mosquito, the flea, the rat, and careless human beings. Our defenses against disease, such as fresh air, sunshine, cleanliness, and good health. Special hygiene, such as domestic hygiene, municipal hygiene, community hygiene, industrial hygiene, school hygiene, "sex hygiene." First aid to the injured, and the care and feeding of infants.

Legal Requirements. — In most city school systems special emphasis is laid on the unhygienic influences of alcohol and tobacco. A number of state legislatures have enacted laws requiring such instruction in the schools of the state. The importance of this instruction is great. No course in hygiene can be complete without including a discussion of alcohol and tobacco. There is, however, a question as to the wisdom of specifying through state law that these subjects be included unless the law is made to cover in addition other equally important subjects such as dental hygiene, the hygiene of alimentation, pathogenic bacteria, the fly and the mosquito as carriers of disease, spitting, and so on. Emphasizing the importance of instruction concerning the unhygienic effects of alcohol and tobacco through legal procedure must inevitably make other seriously important phases of hygiene seem to be a matter of secondary consideration. See ALCOHOL; TEMPERANCE, INSTRUCTION IN.

Instruction in the Training School for Teachers. — The hygiene taught in the training school for teachers should include instruction in anatomy, physiology, bacteriology, and certain phases of sociology. Special emphasis should be placed on the instruction in school hygiene, domestic hygiene, municipal and community hygiene, industrial hygiene, and certain of the general features of military hygiene and sanitation. In addition to the special topics noted in this paper for instruction in the grades and high school, the normal school should cover the following topics in school hygiene: the school site, buildings, and playgrounds; the material equipment, including benches, blackboards, lighting, ventilation, heat, water, toilets, accommodations for exercise, rest, and eating; school supplies, such as pencils, books, chalk, apparatus and utensils; the standardization of schoolbooks; systems of cleaning, such as moist wiping, special sweeping, vacuum cleaning, periodical and special fumigation, and antiseptic cleaning; the food, dress, weight, and morbidity of school children; the fatigue of school children; infectious diseases and school epidemics; the ears, eyes, noses, throats, teeth, and mouths of school children; nervous conditions, cripples, defectives, and the morbid and criminally inclined. T. A. S.

See HYGIENE, PERSONAL; HYGIENE, SCHOOL.

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HYMER'S COLLEGE, HULL. — See GRAMMAR SCHOOL, ENGLISH; COLLEGE, ENGLISH; PUBLIC SCHOOLS.

HYPÆSTHESIA, or HYPOÆSTHESIA. — The decrease in ability to appreciate stimuli. The term is applicable to all forms of sensation, including vision, hearing, taste and smell, as well as touch, pressure, and pain, but is commonly applied only to the latter group of sensations. Since special words are employed to describe the decreased ability in vision, in hearing, in smell, in taste, in temperature sensations, and in pain, it is customary and the best usage (although the custom is not always adhered to) to restrict the use of the simple terms ending in -æsthesia (*i.e.* an-, hyper-, and hypoæsthesia) to the pressure-like sensations such as those of touch and pressure. S. I. F.

See ANALGESIA; ANÆSTHESIA; HYPERÆSTHESIA.

HYPALGESIA, or HYPOALGESIA. — The decreased ability to appreciate painful stimuli. See ANALGESIA; ANÆSTHESIA.

HYPATIA OF ALEXANDRIA. — One of the most eminent women teachers of antiquity, and one of the ablest of the later Greeks. In spite of her remarkable position and the somber tragedy of her death, few passages relating to her survive, but they uniformly ascribe to her an exceptional distinction for culture and influence no less than beauty and virtue. She was probably born between 360 and 370. Suidas says that she flourished under Arcadius (395–408); Philostorgius places her story in the reign of Valens (364–378); and John Malalas describes her as an "aged woman" at the time of her death (416). Her father, Theon, was a distinguished teacher of astronomy and mathematics at the Museum. Two of his many works still survive. But the daughter, Suidas says, surpassed her father in ability, and went on from mathematics to philosophy. She wore the philosopher's cloak, and expounded Plato, Aristotle, and "the other philosophers" (probably Neoplatonist) to large bodies of students. The statement that she taught on the street seems to be a misinterpretation. The article in the *Lexicon* of Suidas is a late and adulterated epitome of an earlier writer, but the letters of Bishop Synesius, an enthusiastic pupil, and the *Ecclesiastical History* of Socrates confirm her position. Socrates says that she "surpassed all the philosophers of the time, and taught in the Platonist (Neoplatonist) school founded by Plotinus." The Neoplatonist school had by that time been detached from the Museum, and its one woman teacher drew pupils from all parts of the Greek world. Hierocles, Synesius, Troilus, and other known scholars were amongst her pupils. Her chief distinction was in philosophy, but she imparted "all disciplines," — mathematics, mechanics, astronomy, and philosophy, — and the letters of Synesius refer to her technical skill. Two large works are mentioned as having been written by her, but they have not survived: an arithmetical *Commentary on Diophantus* and a *Commentary on the Conic Sections of Apollonius of Perga.* She is described as a fluent, precise, and attractive speaker, and is uniformly praised for beauty and high character. Suidas tells that the leading persons of the city used to visit her, as it was the custom at Athens for magistrates to visit distinguished teachers. Socrates narrates that she was friendly with Orestes, the Prefect, and that this friendship led to her lamentable fate. A mob seized her as she entered her litter, dragged her through the streets, and, after tearing her flesh from her bones with oyster shells or broken pottery, burned her remains. The cause is obscure, but Socrates seems to suggest that the Archbishop Cyril's followers laid the blame for the friction that existed between the Prefect and Cyril on the aged and influential pagan teacher. The murder was perpetrated in 416, when Hypatia must have been in or beyond the sixth decade of her life. She is the heroine of Charles Kingsley's *Hypatia.* J. M.

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HYPER. — A prefix to indicate an exaggerated degree of any characteristic. Thus hyperæsthesia is an excessive degree of sensitivity.

HYPERÆSTHESIA. — An increased sensitivity to stimuli in any sensory field, but usually applied to the abnormal sensibility of the skin and the underlying tissues. The hyperæsthesia may be of peripheral or central origin, due to abnormalities in the sensory end organs or in the spinal cord or brain, respectively. Certain substances applied to the skin produce a peripheral hypersensitiveness which is probably due in large part to the increased blood supply. Examples of this are the conditions following the application of very hot, not burning, stupes, of mustard plasters, of turpentine and of cantharides to the skin to act as "counter irritants." All of these leave the skin hypersensitive, at times so much so that the individual cannot bear the pressure of his clothing. Pedagogically the hyperæsthesia are of little importance, except that in a highly nervous individual of unstable mental make-up they may lead to convulsions, to voluntary isolation, etc. S. I. F.

See Anæsthesia, Analgesia, and the references there given.

HYPERALGESIA. — The exaggeration of the pain sense, whereby (1) pain-producing stimuli are felt to be more painful than normally, and (2) the pain threshold is lowered and stimuli which do not produce pain in a normal individual or in normal parts give rise to pain sensations. Sections of the body with a lowered pain threshold are sometimes called "tender areas."

See Anæsthesia; Hypæsthesia; Hyperæsthesia. S. I. F.

HYPERMETROPIA. — See Eye, especially Sections on Hygiene of the Eye and Tests of Vision.

HYPEROPIA. — (ὑπέρ, over, and ὤψ, eye). That condition of refraction where the eyeball is too shallow, and hence parallel rays of light come to a focus behind the retina. The hyperopic eye is an undeveloped eye. It is, in fact, the normal condition of the human eye in infancy. Even with children of school age some investigators have found the majority of children with hyperopic eyes, but the number of such eyes decreases with the increased age and higher grade of the pupils, although the defect remains permanent in a considerable percentage of cases. While it is the normal condition for young children, the fact of this prevalence of hyperopia makes certain hygienic precautions necessary. In the first place the undeveloped eye of childhood, the hyperopic eye, is better fitted for looking at objects at a distance than for near work. Reading, for example, is an occupation peculiarly ill fitted for the hyperopic eyes of children, for their arms are too short to hold a book conveniently even at the normal distance of twelve inches, while a greater distance would be desirable for them. The error of refraction can be overcome by accommodation, but the child with hyperopic eyes reads with great muscular strain. This defect, especially when combined, as frequently happens, with astigmatism, often causes headache and other physical disorders.

When the hyperopia amounts to two diopters, or in any case on the advice of a competent oculist, the error of refraction should be corrected by the use of convex lenses. The fact of hyperopia as the normal condition of the eye in infancy, the changing degree of refraction as the eye develops, and the need of adaptation to the actual condition at each stage, illustrate the importance of yearly tests of children's vision and of expert advice when marked changes occur. W. H. B.

See Eye, especially sections on Hygiene of the Eye and Tests of Vision; also Desks and Seats; Reading, Hygiene of; Writing.

HYPNOSIS. — The phenomena of the hypnotic state are induced through a psychological alteration of consciousness and control, which in turn are presumably conditioned by a change of status of brain-functioning. Though plausible theories have been offered in explanation of the susceptibility to assume the hypnotic state, it cannot be said that we understand its nature, nor just what happens in the nervous system when hypnosis ensues. Psychologically we find in hypnosis a handicapped or impaired functioning, the loss of relation to the environment, to the normal assimilation of experience as material for the personal memory-continuum, and to the normal initiative and direction of the mind's concerns. The losses thus entailed lay the hypnotized subject open to the direct suggestion or command of messages and influences that reach his altered consciousness; so that exaggerated suggestibility comes to be the most conspicuous symptom of the state. That other handicapped states offer analogous relations is set forth under the term "suggestion" (*q.v.*). Through the large areas of excluded mental action and responsiveness there goes out to the impressions that enter an intensive concentration, which again conspicuously characterizes the phenomena of this state. In this respect the analogy of the state to somnambulism as it spontaneously occurs in predisposed individuals is very close, and gave to the state the name of artificial somnambulism.

The typical phenomena may be briefly summarized. The state is induced by the consent of the subject who passively yields to the request to seek sleep, to yield the command of his thoughts and to relax. A sharp command (partly reënforced by strokings or similar manipulations), such, for example, that he cannot open his eyes, may then be successful, and the attempt to open the eyes fail or succeed only after repeated trials. The anticipation of the altered condition being thus gradually established, it is entered upon by trained subjects in response to any sign or suggestion; and similarly a snap of the fingers, an upward stroke, a sharp call in an altered tone, breaks up the state, and restores the subject to the normal condition. The development of the symptoms proceeds rapidly and through suggestion. The subject becomes responsive only to the presence and word of the operator. He sees and hears nothing that is not presented to his avenues of sense by such imposed suggestion. He will regard the fountain-pen as a stiletto, and the upholstered chair as his victim. He will see a blank card as a photograph; and he will fail to see objects really present which he has been informed are spirited away (negative hallucination). He will perform actions seemingly impossible to his normal powers of self-command; and hysterical subjects — the hysterical state either emphasizing or complicating the hypnotic disposition — will show mental influence over functions (such as the healing of scars) physiologically removed from conscious influence. Though obviously endless in variety, the hypnotic phenomena present but the developments of suggestibility, made possible by the limitations of responsiveness and the surrender of directive control. Similarly, the actions of the (deeper) hypnosis remain unrecalled to the waking consciousness and find no place in its memory sequence. But here the psychic impairment becomes more subtle and exhibits the typical relations of the subconscious phenomena. For it may be shown that what is thus excluded from the normal consciousness is not wholly excluded, and by indirect and circumventing devices may be shown to find some sort of registry. Likewise the hallucinations and the insensibilities of the hypnotic state are not wholly complete; and what the hypnotic consciousness fails to perceive yet finds indirect record. (See SUBCONSCIOUS.) The situation becomes yet more complex through the possibility of post-hypnotic suggestion; for here the suggestion, though imposed in hypnosis, is yet acted out in the normal condition. The subject realizes his action, gives some excuse for it, if it is foolish or improper, and accepts it as his own conduct, due to an impulse for which he cannot quite account.

The applications of hypnotic suggestion for the curative treatment of disease, particularly of nervous functional troubles, has the same basis as that of waking suggestion, but through the artificially induced state lowers the resistance which a more nearly waking consciousness might, in spite of a consenting effort, obstructively exercise. Questions of legal responsibility and commission of crimes in the hypnotic state have also led to critical discussions, and have raised the question as to whether the subject does not recognize the sham character of the crime which he hypnotically commits. Yet the practical submission of the subject to the operator's will has led to a more cautious use of the process, and affects the bearing of its practical applications.

Historically the state is connected with the older theories of an actual physical influence streaming from the operator's person and physically affecting the subject, and again to the theories of special sensitiveness of the subjects by virtue of which they developed powers beyond the normal. The former comes directly from Mesmer and the doctrine of animal magnetism, or an all-pervasive magnetic influence which the favored operator embodies in his own person; the latter found its development in the notion of "sensitives" or "mediums" later absorbed by the spiritualistic sense of the term. It was the outgrowth of these unsupported notions and the explanation of the phenomena on the basis of an altered physiological and psychological state that was the special contribution of James Braid (1795–1860), and which inaugurated the modern study of the topic. (See MESMERISM.) J. J.

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HYPNOTISM. — See HYPNOSIS.

HYPOTHESIS. — A supposition, a theory, or a mode of explanation held tentatively pending further inquiry, because of its value in the organization of knowledge and in direction of inquiry. The increased importance attached, in the development of modern science, to making and using hypotheses is a necessary part of the evolution of inductive and experimental science. It marks the attainment of a genuinely critical reflective attitude, and provides the working method for dealing with the otherwise insoluble antagonism of dogmatism and skepticism. The older and classic scientific attitude (commonly called deductive, but better termed subsumptive or authoritative) assumed that science was possible only where there existed a body of absolutely certain and definite fixed principles of "truths," under which empirical or observable data might be brought. Only as the body of experienced data was subsumed under the absolute first principles did the former acquire logical systematization and rational justification, that is, the characteristic traits of a science. These first principles were themselves, accordingly, of a radically different nature from that of the facts of experience. The former were universal and necessary; self-evident truths of reasons or rational intuitions, innate ideas, *a priori* to all experience. The latter were *a posteriori*, the result of sensations and imagination, contingent, fluctuating, particular. When acceptance of ultimate rational principles was made the foundation of all science, doubt and denial of their existence led to skepticism regarding the possibility of knowledge. Dogmatism and skepticism thus exhausted the philosophies of knowledge.

The modern scientific movement began when men gave up the notion that science consisted in defining and classifying existences just as they were found and substituted the search for processes and energies which made the objects, or brought them into existence. The latter point of view necessarily involved the use of imaginative conceptions of *possible* causes. The speculative danger latent in the new method was checked by insistence that the imaginative conceptions, or hypotheses, must lend themselves to mathematical statement, deduction, and to corroboration by the results of experimental observations. Descartes' theory of knowledge marks the transition from the older to the newer, or scientific, logic. He retained the notion that science begins with truths or concepts of pure reason, and that what was needed was concentric deduction from these universals, until the phenomena revealed to sense observation were approximated. At the same time he insisted upon the necessity of definite and accurate (mathematical) formulation of these ultimate notions and upon methodic procedure, a series of intermediate steps from the universal to the particulars. When the Cartesians called these ultimate principles " hypotheses," they did not mean to imply their doubtful character, but rather that they were " placed under " all the particular facts of existence and of science. When Newton said that he did not make hypotheses (*non fingo hypotheses*), he did not mean (as is sometimes stated) that he did not gratuitously invent them, but that he did not employ them in the Cartesian way. In the modern sense, no one invented or used hypotheses more freely than Newton; but, as against the Cartesian theory of the world, he held that general interpreting principles must not be derived from pure thought, but be suggested by experience and then transferred by analogy to other phenomena; their verification existing in the suggestion of new or experimental observations exactly confirming the deductive results. In Kant, we find again an inconsistent compromise of the old and the new logics. He recognizes that science does not consist in the mere accumulation and classification of facts, since it requires conceptions which the mind, from its own initiative, uses to cross-examine existing observations and employs also as methods of undertaking new experimental constructions. To quote his own words: " When Galileo caused balls which he had carefully weighed to roll down an inclined plane, or Torricelli made the air bear up a weight which he knew beforehand to be equal to a standard column of water, a new light broke on the mind of the scientific discoverer. It was seen that reason has insight only into that which it produces after a plan of its own, and that it must itself lead the way with principles of judgment and force nature to answer its questions." But in his general philosophic formulation of this insight, Kant overlooked the fact that the " principles of judgment " with which thought approaches objects are purely hypothetical in character and are approved or rejected according as they work out in experimental construction of objects. Accordingly, his philosophy, though called critical, was at bottom a revival of dogmatic rationalism, since he held that knowledge requires a fixed stock of *a priori* concepts that are imposed once for all upon objects. The inherent difficulties in this position conspired with the constantly increasing emphasis upon experimental verification to discredit the older empiricism and rationalism alike, and led to the formulation of the doctrine that all general ideas, or concepts, are originally purely hypothetical, gaining certainty as they work successfully to interpret and organize observations and to direct further fruitful experiments. In placing the standard of value for concepts in their use, instead of their structure, the resulting functional empiricism becomes truly critical, assigning a distinctive important rôle to concepts, a rôle not capable of being played by facts and observations by themselves, but insisting also upon the need of experimental test. J. D.

See CONCEPT; IDEA; JUDGMENT; KNOWLEDGE; METHOD; PRAGMATISM.

HYPSICLES. — See GEOMETRY.

HYSTERIA. — Among medical men there is the greatest difference of opinion regarding this topic; some deny the existence of a special disease under this name and would group the patients under other headings, while others include all cases that cannot clearly be diagnosed in other ways. In other words, for some hysteria does not exist as a medical entity, for others it is the name for a scrap basket into which cases are thrown if they do not fit into the regular pigeonholes. It is, therefore, difficult, perhaps impossible, to define the term in any manner that will be satisfactory to all, but it may be said that the best opinion is that hysteria is a disease of a nervous character, with varied manifestations which may simulate the conditions in many organic diseases, nervous and otherwise.

The symptoms in hysteria have been the subject of much discussion, and on the limitation of the symptoms depends the conception of the disease. The symptoms in this disease are extremely varied, and in a general way may be confused with corresponding symptoms in other diseases. The following classes of symptoms may be distinguished: (1) emotional instability; (2) abnormal suggestibility, which Babinski regards as the chief characteristic of hysteria, to the extent of holding that the other accompanying phenomena of the disease are due to the suggestion of the examining physician or the patient's reading; (3) sensationalism due to an exaggerated ego, which leads to a desire to win notoriety and sympathy in any way whatever; (4) motor disturbances, *e.g.*, convulsions and tremors as well as paralysis and motor defects; (5) sensation disturbances; (6) vasomotor, trophic, and secretory disturbances, about which, however, there is little agreement. Jelliffe, in the best account of the whole hysteria problem, has given the broadest expression to hysteria in defining it as " a general tendency to certain reactive expressions," which have already been noted above. Babinski throws aside the classical symptoms as noted by Charcot and his followers as artifacts and poor observation, and attributes the disease wholly to suggestion. Other psychological explanations of hysteria have been advanced, and in general it may be said that the psychological hypotheses are more satisfactory than those of a physiological nature, *e.g.* those in which attempts have been made to correlate the symptoms with cerebral conditions. The most important of the psychological explanations are those of Janet and of Freud. The definition of Janet, which gives his general explanation, is as follows: " Hysteria is a form of mental depression, characterized by the retraction of the field of personal consciousness and by the tendency to the dissociation and the emancipation of systems of ideas and of functions, which by their synthesis constitute the personality." The symptoms are due to a narrowing of the field of consciousness, to an inattention which produces in general an amnesia. The anesthesias are, according to this view, due to lack of attention to the sensations from the body and the paralyses to a similar cause. The sensation elements are grouped in a subconsciousness, if we may speak of such a thing, and they are there combined just as are the conscious perceptions. The combinations give rise to impulses which are not consciously controlled, and there appears to be a splitting or a doubling of the personality.

Most authors agree, that although the hysterical manifestations do not become obtrusive until the third and fourth decades of life, the impressions that lead to the manifestations are obtained during the first fifteen years. The explanations of Babinski and of Freud indicate the possibility of hysteria formation in children. The abnormal stimulation of bright children, the fixation of the attention upon his health, and the permitting a child to daydream help in the formation of the characters that become hysterical. The vicious habit of obvious concealment from maturing children of all matters of a sexual nature, with the consequence of the acquisition of false notions, and the harsh treatment of childish fears lead to the formation of abnormal modes of reaction and to repressions and concealments of emotional states which may become nuclei for hysterical manifestations in later life. S. I. F.

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IAMBLICHUS. — See Neo-Platonism.

IBN EZRA, ABRAHAM BEN MEIR (ABEN EZRA) (1092?-1167). — A Jewish scholar, poet, philosopher, and mathematician. The first period of his life was spent in Spain up to 1140, his home being in Toledo; the rest of his days was spent abroad, mainly in Italy. Ibn Ezra traveled much, and, in addition to the countries of the Mediterranean coast, visited France and England. His reputation rested for several generations on his commentaries on the Holy Scriptures, for he raised the art of Biblical exegesis to the degree of a science. He helped to revive Hebrew scholarship outside Spain. Ibn Ezra also wrote on grammatical terms in Hebrew, on style, and meter (*Zaḥot*, 1145). In his philosophical works, traces of Neo-platonic influences may be found. His mathematical writings were numerous and include works on the peculiarities of the numbers one to nine (*Sefer ha Eḥad*); on arithmetic (*Sefer ha Mispar*); on the calendar (*Sefer ha Ibbur*); on the astrolabe (*Keli ha Nehoshet*); on three chronological questions (*Shalosh She 'elot*); and composed astronomical tables (*Luḥot*), and translations of the astrologer Mashallah. He is the subject of Robert Browning's poem, *Rabbi Ben Ezra.*

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ICELAND. — A large mountainous volcanic island in the North Atlantic Ocean (latitude) 63° 24′–66° 32′; (longitude) 13° 32′–24° 35′ W. Area, 40.437 square miles; climate comparatively mild, especially in the south. The population is 83,000 (1909), engaged chiefly in sheep raising and in fishing.

History and Government. — The effort has been made, but on very slight evidence, to identify Iceland with the Thule of Pytheas; traces of Irish settlers (monks) were found by the first Norse discoverers. The Norwegians began to migrate to Iceland in the year 874, and in the next sixty years the island was fully settled. Government, in the form of an aristocratic republic, was organized in the year 930. Christianity was introduced in the year 1000. The Icelandic republic lasted until 1264, when Hakon, King of Norway, helped by the long-continued feuds between noble families of the island, was able to induce the Icelanders to be incorporated in the Norwegian monarchy. Iceland with Norway was united to Denmark in 1397. The main events under Danish rule to the opening of the nineteenth century are as follows: Introduction of the Reformation, practically complete in 1550 when the Danes had become the real national leaders; the last Catholic bishop, Jon Arason, and his sons beheaded; the grant of a monopoly in Icelandic trade to a kind of colonial company of Copenhagen merchants, 1602 — an economic blunder of the Danish government, which brought the island to the brink of ruin; abolition of the Althing in 1800, which meant the sweeping away of the last traces of Icelandic independence.

In the nineteenth century, especially after 1830, there was a marked revival of national feeling and a struggle for national independence, resulting in 1843 in the restitution of the Althing in the form of modern legislatures (advisory only). The constitution of the millennial year, 1874, gave the Althing legislative power subject to the veto of the King, the executive power being in the hands of a governor. The present constitution, adopted in 1903, gave the Althing increased power and placed the executive power in the hands of a minister, an Icelander residing in Iceland and having a seat in the King's cabinet.

Language and Literature. — The main body of the settlers of Iceland having come from Norway, the language naturally was developed from the West-Northern dialects of that country and got its literary form in Iceland on account of having been comparatively early put to literary use; it has been preserved far better in Iceland than in any of the other Scandinavian countries. The modern written language differs from that of the Sagas about as much as Tennyson's language differs from Shakespeare's. This has the far-reaching educational result that every boy and girl has access to real classics, at the same time interesting to youthful minds. It is impossible to understand the intellectual characteristics of the people without reference to the national literature which is taught in all schools.

The Icelandic Literature comprises: 1. Eddas — Saemundar Edda (Older Edda), a collection of cosmogonic, epic, and didactic poems, collected without doubt in Iceland and largely composed there. Snorra Edda, a textbook of mythology explaining the constantly recurring metaphors (*Kenningar*) of the "Scalds," giving the myths of the Scandinavian race and copious quotations from the older poets, showing their use in poetic technique.

2. Sagas, which can be divided into three groups: (1) Historical sagas, mainly by known authors, as Snorri Sturluson's *Heimskringla* (history of the kings of Norway); the Sturlanga saga, written by a contemporary and participant in the events, Sturla Thordason. (2) Family sagas relating the actions of the leading aristocrats at home and abroad, founded always on fact, but idealized for æsthetic motives. The form in some instances is concise, as in the modern short story (Maupassant); such is the story of Gunnlang, the Worm Tongue. Sometimes it is of epic proportions; stories of whole countrysides or families, as in *Njala*, the most artistic and famous of all. (3) Romantic and legendary sagas often written under foreign influence (*Chansons de geste*, Briton lays, etc.). These are almost entirely medieval, and lack the realistic spirit of the genuine sagas. The Eddas and sagas belong, it may be said, to the period *c.* 850–1300.

Besides the Eddic poetry, generally simple in form, — as *Beowulf*, — is the scaldic poetry, court poetry in praise of kings and princes, extremely artificial in form. To the period 1300–1500 belong the historical ballads (*rimur*) and some splendid religious poems in the old scaldic meter, as Eysteinn Asgrimsson's *Lilja*. From the fifteenth down to the nineteenth century, there was a lull in the intellectual life of Iceland, broken, however, by a few notable productions, as Hallgrimur Pjetursson's Passion Psalms, the sermons of Bishop Jon Vidalin, and the poems of Stefan Olafsson and Benedict Grondal (the elder).

The poetic renaissance came in the nineteenth century, coinciding very nearly with the political awakening. The leader in this development was Jonas Hallgrimson, whose influence was felt to the end of the century. The chief poets of the later romantic school, 1850–1880, were Steingrimur-Thorsteinson, Benedict Grondal the younger, and Matthias Jochumson. To this period succeeded that of realism (1882), inaugurated by the poet-journalist Jón Olafsson. Lyric poetry reached its height in this period in Hannes Hafstein, author of the spirited ballad, " The Death of Skarphedinn." The realistic impulse naturally gave rise to novelists, of whom the greatest is Gestur Pálsson, and to dramatic art. The latter is stimulated by the establishment of a permanent theater at Reykjavik.

Educational Beginnings. — Iceland having been settled mainly by the Norwegian aristocracy, the intellectual standard was naturally very high from the beginning. The vikings and local chiefs who emigrated to Iceland were often men who had traveled far and wide, and had seen the civilization of the Celt, the Frank, Saracen, and Byzantine. On the other side, Christianity in Iceland was introduced more as a political than a religious measure, and its sponsors were the weightiest men of the land; the æsthetic and moral ideas are still closely connected with the old belief. The people are almost without exception Lutherans, the State supporting the Lutheran Church; but there is complete religious liberty. The island forms one bishopric with 105 parishes. In earlier times the educational supervision was entirely in the hands of the clergy. Primary education was always well provided for, the children being taught at home by their parents or by peripatetic teachers. The pastor would visit each family in his parish once a year, examining the children in the elementary branches; if it was found that a child had not received proper training, the pastor had the power to order it taken away from the parents and educated at their expense by some more competent person.

Present Conditions. — Since the new public school system was introduced, 1907, great progress has been made. Illiteracy is practically unknown, and almost everybody can write and knows the elements of arithmetic. Young and old are very fond of reading, and the young people acquire on their own accord further information, especially a knowledge of Danish, of later years also of English, and thus gain access to larger literary fields; the ancient and modern Icelandic literature, as well as newspapers and periodicals, are eagerly read. Each town has a public school, and there are a number of higher schools: a classical college at Reykjavik with about 100 students (a continuation of the old cathedral schools at Hólar and Skalholt); two *real* (or scientific) schools; three schools for women; and some public high schools. At Reykjavik are the following special institutions: a normal school, a school of navigation, a commercial college, and a technical school, also agricultural schools at Hólar and Hvanmaeyri.

The three professional schools, of theology (est. 1847), medicine (est. 1876), and law (est. 1907), were in 1911 incorporated into the University (*Hárskóli*) of Iceland, which also embraces a faculty of philosophy and history, literature, and language of Iceland. The university was inaugurated Oct. 4, 1911.

The national library (*Landsbókasafn*) at Reykjavik has the most complete collection in the world of books printed in Iceland (73,000 volumes and 6400 Icelandic Mss.). Besides the college library at Reykjavik, with a large and valuable collection of books and Mss., Iceland has three county libraries. The national archives (Rikiskjalasafn, est. 1882) have the safe custody of. all civil and ecclesiastical records more than thirty years old. The archæological museum (*Forngripasafn*), established 1863, has about 6000 objects. The society of naturalists (*Islenzka natturnfraedislaj*), established 1889, has a museum of natural history. All these collections are housed in the national library building.

Of learned societies, etc., must be mentioned the Icelandic Literary Society (*Hid islenzka nát'urnfraedisfjelag*, established 1816; the Icelandic Historical Society (*Hid islenzka sógnfélag*), established 1902; the Agricultural Society, etc.

The financial estimates of 1910–1911 carried a total of 2,930,000 crowns ($785,240). Of this amount 502,000 crowns ($134,436) were voted for the Church and education, and 145,000 crowns for scientific and literary purposes. Thus it appears that 22 per cent of the total budget was for intellectual and religious institutions.

Iceland has about a dozen printing establishments (the first introduced in 1530), which at present issue about twenty newspapers, published once or twice a week, and some ten periodicals. During the last century many Icelanders emigrated to America and established flourishing settlements in North Dakota and Manitoba; they publish journals of their own, which are also much read in Iceland.

St. St. and T. J.

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ICKELSAMER, VALENTIN (1500?–1541?). — The author of the first German grammar. He was born in the old free city of Rothenburg on the Tauber and studied first at the University of Erfurt and then at Wittenberg, where he was attracted by the fame of Luther and of Melanchthon. In 1525 he held the position of a German schoolmaster in Rothenburg, which city was then agitated by the socialistic movement later culminating in the peasants' rebellion. Ickelsamer took an active part in this movement, in consequence of which he had to flee from the city. He went to Erfurt and from there to Augsburg. There, in 1534, he published his *Deutsche Grammatica* (*German Grammar*) in which he made a strong plea for the study of the mother tongue. The book contained interesting remarks on orthography and etymology, but its chief object was to show a new method of teaching reading based on the phonetic value of the letters. In this Ickelsamer was about three hundred years ahead of his time, for it was not until the second half of the nineteenth century that the old alphabetic method was finally discarded in the schools.

F. M.

IDAHO, STATE OF. — First organized as a territory by Congress in 1863, Idaho was admitted to the Union in 1890 as the forty-fourth state. It is located in the Western Division, and has a land area of 84,290 square miles. In size it is a little larger than Kansas; nearly twice the size of Pennsylvania; and would make ten states the size of Massachusetts. For administrative purposes it is divided into twenty-three counties, and these, in turn, are divided into school districts of irregular and varying size. In 1910 Idaho had a population of 325,594, and a density of population of 3.8 people to the square mile.

Educational History. — Owing to the small number of inhabitants in the territory, little was done toward the establishment of schools previous to 1870. In that year the census returns showed only 466 pupils in the schools of the territory, and a total school population of only 888. By 1875 the school population had increased to 3852; by 1885, to 15,399; by 1890, at the time of the admission of the state, it had increased to 27,311; and by 1908 it had reached 85,216. In 1875 the laws which had previously been passed were gathered up, added to, and reënacted in the form of a new school law for the territory. The territorial controller was made *ex officio* territorial superintendent of public instruction; the auditor of each county was made *ex officio* county superintendent of schools; and three trustees were to be elected to take charge of the schools of each school district. The main lines of the present school system were laid down in this law; the chief changes since that time being in the increase of the powers and duties of the county and state school officials, at the expense of the district organizations. The trustees of each district, under the law of 1875, examined and licensed all teachers, adopted textbooks, and generally managed the schools, while the superintendents collected information, made reports, and apportioned funds. A county school tax of from two to five mills was levied for the support of the schools. In 1874 there were seventy-seven school districts, fifty-three schoolhouses, three school libraries, and 2030 pupils in the territory. The increase of the territory in both population and schools was slow during the eighties, was more rapid after its admission as a state in 1890, and has been still greater since 1900. For some time the progress of the schools was retarded in certain counties by trouble with the Mormons, but after 1890 this seems to have disappeared. In the revised school law of 1883 the office of county superintendent was created and separated from that of county auditor; teachers' institutes were begun; and the functions of the State Superintendent's office were enlarged. In 1887 the separate office of State Superintendent of Public Instruction was created. Since the admission of the state, educational progress has been rapid.

The act of admission gave the state a large amount of land for educational purposes. The common schools received the sixteenth and thirty-sixth sections in each township, or a total of 3,068,231 acres; two townships, or 46,080 acres, were given for a state university; 40,000 acres were given for a state school of science, which, in 1907, was added to the state university endowment fund; 100,000 acres were given for normal schools; 40,000 acres for a state academy; and 40,000 acres for a state industrial school. The constitution fixed the minimum sale price at $10 an acre, but the sales so far made have been for more than twice this price. Only about one tenth of the school lands are now under lease. These lands will, in time, sell for a good price, and the funds thus created will yield a large income for education. The state constitution of 1890 made very detailed provision for a state system of education. A State Board of Education and a State Board of Land Commissioners were created; the public school fund and lands were carefully safeguarded; a minimum price of $10 an acre was set on all school lands; any form of aid to sectarian or religious schools or societies for any purpose, as well as religious tests and the teaching of religious tenets, were forbidden; compulsory education was authorized; the university was located, and the title to university lands was confirmed; and the territorial office of county superintendent was abolished, the probate judges of the county being made *ex officio* county superintendents. In 1892 the University of Idaho was created, and the same year the first state teachers' association was organized. In 1893 a free textbook bill and a compulsory education law were enacted, and state normal schools were established at Lewiston and Albion. In 1896 the constitution was amended to provide for the re-creation of the office of county superintendent. In 1899 the State Textbook Commission was reconstituted, and its work made more definite. In 1901 the Idaho State Academy, a secondary and technical school, was established at Pocatello, and a State Library Commission and traveling libraries provided for. In 1903 the Idaho Industrial Training School, a reform school for boys and girls, was established at St. Anthony. In 1905 the State Board of Education was given power to issue teachers' certificates of a higher grade, valid anywhere in the state; and the compulsory education law, long a dead letter, was revised and strengthened, and county probation officers provided for. In 1907 three six-weeks normal schools were organized. In 1909 rural high schools were established; a State Board of Examiners was created; the system of certification was changed into a full state certificating system; required meetings of school trustees were provided for; and a state school law commission was created. In 1911 this commission reported, and its report was accepted by the legislature, and a new school code enacted. This materially enlarged the powers of the State Board of Education, changed the plans for certificating teachers and apportioning school funds, and made changes in the management and instruction in all rural high schools.

Present School System. — At the head of the school system is a Superintendent of Public Instruction, elected for two-year terms by the people; and an *ex officio* State Board of Education, consisting of the State Superintendent of Public Instruction, the Secretary of State, and the Attorney-General. There are also a State Board of Land Commissioners, created by the constitution, and composed of the members of the State Board of Education, with the Governor added; a State Library Commission, consisting of the State Board of Education, with the President of the State University added; a State Textbook Commission, consisting of the State Superintendent of Public

Instruction and six others, appointed by the State Board of Education, two to be practical business men and four to be teachers of at least five years' experience; and a State Board of Examiners, who read and grade all examination papers and grant all teachers' certificates for the entire state. To the State Board of Education is given general supervision over the schools of the state and the preparation of a uniform course of study for the elementary and high schools of the state. The State Superintendent acts as the executive officer of the Board; apportions the income of the school fund semiannually; visits the counties, and holds meetings with the county superintendents; makes rules and regulations for the conduct of teachers' institutes, and appoints assistant conductors for each one; prepares and distributes all blanks and forms used; and makes a biennial report to the Governor. He or she (women have held the office continuously since 1899) is also a member *ex officio* of the Boards of Trustees of the two State Normal Schools, of the State Academy, and of the State Industrial School.

The State Board of Land Commissioners is charged with the duty of locating, protecting, renting, and selling the school, university, and other lands granted to the state by the General Government by the act of admission. The State Library Board has charge of the traveling libraries of the state, and is directed to coöperate with public and other libraries anywhere in the state. The State Textbook Commission selects the textbooks to be purchased and supplied to the schools of the state, high schools included, and makes six-year contracts with the publishers.

In each county there is a County Superintendent of Schools, elected by popular election for a two-year term. He (or she) must be a practical teacher of at least two years' experience in Idaho, and must hold at least a first grade teachers' certificate to qualify for the office. He is required to hold monthly meetings with his teachers; to visit each school each term; to apportion the school money to the districts; to conduct an annual teachers' institute; may require trustees to make repairs, or to abate a nuisance; may transfer pupils and their quota of funds from district to district; keeps all records; and makes an annual report to the State Superintendent of Public Instruction.

In each school district a board of three school trustees are elected, one each year, at an annual school election. District lines may be altered and new districts created by the Board of County Commissioners. Any district may establish a kindergarten or a high school, and all must provide a five months' term of school and have an average daily attendance of five. Trustees have charge of all school property, and are empowered to employ teachers and fix their compensation; by vote of the district may build, rent, furnish, or sell schoolhouses and sites; may spend 25 per cent of the school money for fuel, janitor, supplies, and equipment; must spend 3 per cent of the school money for the school library; may dismiss pupils; must compile an annual school census of all pupils six to twenty-one in the district; and must publish an annual financial report. Teachers must make a yearly report to the County Superintendent of Schools. Any district having a valuation of $150,000 may be organized as an independent district by the County Commissioners. Such independent districts have six trustees, who have, in addition to the powers and duties of trustees of ordinary districts, power to levy a special tax sufficient to provide a nine months' school. If a district employs 35 teachers, it may also employ a superintendent and adopt its own textbooks.

School Support. — No state tax is levied, but a required county tax of not less than five nor more than ten mills is levied, and any school district may vote a local district tax up to twenty mills. The apportionment of income from the state school fund is made to the counties on the sole basis of the number of school census children. In the counties all county taxation, fines, and license moneys are added, and the total is then apportioned to the districts, one third equally to each, without reference to its size, and two thirds on the basis of school census, less 5 per cent, which is withheld for apportionment to the rural high schools. District trustees must levy a tax sufficient to provide five months of school, and the voters of any district may vote a further tax up to a total of 20 mills. Independent districts have special taxing privileges.

Educational Conditions. — Of the population of 1900, 15.2 per cent were foreign born, 57.7 per cent were males, 3.5 per cent of the total population were Indians, and 1.7 per cent were Chinamen. But 6.2 per cent lived in cities of 4000 or over, while the remainder lived in country districts or in little towns. The state is sparsely populated, large areas being practically uninhabited. The chief occupations are mining and agriculture. The compulsory education law has long remained unenforced. It was revised in 1905 and made more definite, and a probation officer was appointed for each county to assist the Judge of the Probate Court in dealing with the worst offenders. By the new law children eight to sixteen years of age are required to go to school the entire time the schools are in session, though children over fourteen are excused if they have completed the eighth grade, as are all children who are instructed at home or who are physically or mentally incapacitated, or whose labor is necessary for the support of themselves or their parents. Trustees are required to report all delinquent children to the County Superintendents of Schools, who in turn reports them to the Probate Judge.

In material conditions the schools have made very rapid progress within the past fifteen years. Many of the town and high school buildings are substantially built and fairly well equipped. The average value of the school buildings of the state is about $3000. The schools are rapidly being graded and standardized. All schools follow a state course of study. All pupils who complete the eighth grade pass the uniform state examination, and this certificate is required for admission to the high schools of the state. Manual training, domestic science, and agriculture are included in the state course of study as optional studies, and a number of schools are reported as making a beginning in these subjects. Two towns are reported as offering regular instruction in manual training. In a few places large consolidated schools have been established, and the pupils are transported to the central school. The state has a good school library system which has been in existence for a long time. Each school district must make yearly additions to its school library; the traveling library system is efficient; and any town or city may levy a tax of one mill for library support. On petition of twenty voters in any school district, an election must be called to vote on the question of a similar library tax on the property of the district.

Teachers and Training. — For the training of new teachers the state maintains two state normal schools, and since 1907 has maintained three summer schools, offering a six weeks' course of instruction. The certification standards are better than in many other states, and the certification plan has an especial merit in that it provides for a partially graded series of examinations leading up to the highest diploma.

Secondary and Higher Education. — The state maintains the Academy of Idaho at Pocatello, and the University of Idaho at Moscow (*q.v.*). The Academy of Idaho offers preparatory, business, and technical courses. The University of Idaho is the only institution of higher learning in the state. High schools are developing rapidly, considering the sparsity of population, there being fifty-one public and private high schools on the University of Idaho list of inspected institutions in 1908, and new schools are being organized each year. The union-district high school law of 1909, and the authorization of two-year agricultural high schools in the same year, will add a new stimulus to their development. The state maintains the Idaho Industrial School at St. Anthony, a reformatory institution for both sexes; and in 1909 established a state institution for the deaf, dumb, and blind of the state, who had heretofore been cared for elsewhere, under the supervision of the State Board of Education. E. P. C.

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IDAHO, UNIVERSITY OF, MOSCOW, IDA. — A coeducational state institution established in 1889. Its government is in the hands of a board of nine regents appointed by the Governor. In addition to the college courses, preparatory, music, engineering, and agriculture courses are offered. The entrance requirements are sixteen units. Courses are offered in the college of letters and sciences leading to the degrees of A.B., B.S., Mus. B., and B.S. in domestic economy, as well as the A.M. and M.S. The college of agriculture gives a four-year course leading to the degree of B.S., and a short winter course of a general nature. The college of engineering provides four courses in different departments of engineering, each leading to the appropriate degree. The State Teachers' Certificate is given to those graduates with the A.B. or B.S. degree who have taken courses in education. The enrollment in 1910–1911 in all departments was 527. The faculty consists of fifty-four members, of whom nineteen are full professors.

IDEA AND IDEATION. — Ideation denotes either the act of thinking or the course, the stream, of ideas, according as ideas are regarded as manifestations of a soul substance or spiritual entity, or as mental contents which in their associations and sequences make up the mind. Upon a third view, it expresses the function exercised by ideas, the results they effect in subsequent experience. So far accordingly as the word is not a synonym for the process of thinking (*q.v.*), its meaning depends upon that assigned to the term "idea."

Historically, the term "idea" dates from the Platonic philosophy. With him, it means an absolute, unchanging, immaterial archetype, standard, or pattern, which the manifold changing particulars of sense that are called by the same name partially share in and represent. It was the form, the nature, the essential character of a set of particular existences. It was their universal, generic, and also their end, their completion, or perfect reality. Through its presence, and only through its presence, are changes controlled, or made other than an aimless, chaotic flux which as a flux is unknowable because not enduring long enough to have any assignable character. Within the world of physical change or becoming, these ultimate immaterial essences appear as mathematical forms. Mathematical relations supply nature with all its regularity and recurrence, with whatever is constant, or resembles constancy, amid the scene of change. They also supply the only conditions through which nature may be, in any genuine sense, known, be matter of science. The usual charge against the Platonic theory of ideas is that it confused mental concepts with things. If the charge means that Plato began with psychical existences or even with logical abstractions and ended with hypostatizing them, it quite misses the method and object of Plato. He began with changing objects, acts, and beliefs, and concluded that self-consistent beliefs, stable modes of behavior (individual and social), permanently real objects (and no object not permanently real can be truly real at all) all imply unified eternal essences, which as unified and eternal must be immaterial. This meaning of the term (or of its Latin transliteration of the Aristotelian *eidos*, species, namely) lasted through the entire scholastic period, nominalism alone denying the objective existence of archetypal standards of action and belief. Moreover, through the use of final causes in the medieval science of nature, these standard patterns, in the form of the ends for the sake of which events occur, were assumed also to be the keys to the natural sphere. Even to-day, any one who believes in absolute eternal objective standards or types of justice, truth, law (whether natural or moral), etc., to which particular sets and events tend to conform (or should conform) accepts the essentials of the Platonic doctrine of ideas.

Quite early in modern thought, however, the term "idea" began to change its signification, taking on a more distinctively mental coloring. The notion of objective pattern shaded over into that of internal design, a mental copy according to which an action is carried on; the notion of objective end similarly shades into that of *conscious* intent, purpose as a mental copy of some result to be accomplished. In this way, the term "idea" came to designate any object so far as that object was held in mind, whether for purposes of action or thought. According to the scholastic theory of knowledge, the *species*, the kind, was always the real object of knowledge, even in dealing with a particular thing; that is, in *this* table the table-character is what is grasped by intelligence; whatever does not take the form of such a universal is incognizable. John Locke also called the immediate object of the mind in knowledge an idea, but according to him general characters are never directly apprehended objects or simple ideas. On the contrary, sensible qualities, red, hard, loud, sweet, etc., are the forms, the ideas, which mind grasps or "knows" directly. But Locke also accepted the notion that many of these qualities exist only in *mind*, and so he tended (though with some ambiguities) to hold that the objects of the mind in knowledge are mental objects only. Locke's influence practically determined, accordingly, the subsequent sense of the term "idea" — namely, mental event, occurrence, existence, especially if any cognitive force is attached to the mental existence. However, even this restriction was not always observed; idea was often used to designate any mode of so-called psychic existence, such as a feeling, desire, etc. (The word "thought" has also been used in the same loose style.) On the other hand, some surviving flavor of the earlier intellectual connotation clung to the term, so that, following Hume, many psychologists reserved the term for secondary or revived mental events, keeping the terms "sensation," "feeling," "impression" for the primary.

The significance of the term is still further confused by the fact that it has developed a sense intermediate between the original Platonic objective one and the modern psychic one: a logical usage to denote meaning (*what* is meant), conception (*what* is conceived), the object of intellectual reference as distinct from the act of referring. The fundamental importance of meanings in mathematics, the fruitful way in which these meanings interact for the production of new meanings which no inspection of the original meanings could have revealed, the objective coherence of the resulting systems, have led to the formation of a school of Neo-realism which insists that the science of mathematics proves the independent existence of intellectual essences, not subject to the flux of time and non-physical in character. Moreover, many critics have pointed out that the psychical school confused ideas as meanings with ideas as private, psychic existences, thus making knowledge impossible, since knowledge requires that sensation, image, idea, have a stable reference beyond its own existence. The use of hypothetical meanings as tools of inquiry has meantime suggested still another sense for the term "idea" — that of tentative hypothesis, suggestion, theory. This interpretation mediates between the two conceptions of meaning as pure objective essence and idea as mere psychic existence. As uncertain and tentatively used, the hypothesis or suggestion is mental; in its application and possible outcome, if confirmed, it is subjective.

J. D.

See Conception; Hypothesis; Method; Thinking; also Association of Ideas.

IDEAL COMMONWEALTHS. — See Utopias and Education.

IDEALISM. — In the history of thought, idealism covers two things very different from one another, each kind including many varieties and both distinct from the meaning of the term "idealism" as employed in life. In the latter sense, idealism means a praiseworthy *moral* attitude, consisting in devotion to high aims, to ideals, even at the expense of personal loss in material comfort and financial gain. In its technical philosophical meaning, the two types of idealism are characteristic of ancient and modern thought, respectively. The former is primarily a teleological theory of the cosmos, of nature; the latter is primarily an assimilation of nature to consciousness. Classic idealism was a systematized method of interpreting nature from the standpoint of final cause (see Cause). It held that nature exists for the sake of realizing purpose, the ultimate purpose being the Good. The degree of reality possessed by any temporal or phenomenal form of existence is accordingly measured on the scale of the degree in which it embodies or realizes the End, the Good. Reason, intelligence, was conceived as either the highest, the final, good of existence or at least as an indispensable element in the culminating end. It was not conceived, however, as either the efficient cause of nature or as the stuff out of which apparently physical things are made. Nor was the proof of idealism sought in psychological or epistemological grounds. On the contrary, the theory of knowledge was such as would now be termed realistic. It held that the human knower, the individual mind, became intelligent or rational through the process of knowing objects that exist independently of it, by means of appropriating to itself the amount and kind of ultimate reality embodied in them. In the phraseology of Aristotle, sensation is a realization of the sensible qualities of objects; imagination of their form so far as still immersed in particular cases; reason of their universal form, free from particular limitations. And while Plato and Aristotle, the two great names of classic idealism, disagreed in many respects, they were at one in holding that our mental operations are to be viewed and explained from the standpoint of objective reality, not objective reality from the standpoint of our operations of knowing. Consequently, while much is made of reason as explaining the order, the harmony, and proportion found in nature, little is made of the chief concept of modern idealism, consciousness, so that the term hardly appears as a significant conception.

Modern idealism may be said to have found its points of departure in two convictions: (*a*) The most certain, the best known, thing is an individual's own inner life, his play of emotions, hopes, fears, pleasures, pains, ideas, memories, etc., what was later termed consciousness, or the psychic; (*b*) all objects as known are relative to the processes of sense-perception and judgment that are involved in knowing them. (1) From the feeling that the surest, the most accessible region, in fact the only directly accessible and absolutely sure thing, is the individual's own inner life, it was but a step to the conclusion that the sole escape from skepticism as to the possibility of scientific knowledge of the world, as well as the sole way of explaining how a physical world can interact with a mental world, is to resolve that external world itself into psychic material. The assimilation of the objective to the subjective has been the characteristic trait of every form of modern idealism. (2) The conviction that sense qualities are relative to the individual percipient had been held by some of the sophists in antiquity. Under the prevailing conditions of science at that time, however, such a theory could issue only in intellectual nihilism, the denial of all stable knowledge. The case was quite otherwise with the beginnings of modern science. All those interested in removing from science the incubus of explanation through final causes fastened upon it by scholasticism and in substituting a mechanical mode of explanation, were interested in reducing physical nature to a homogeneous medium, to mass, motion, space, and time capable of interchangeable statement in terms of one another. The most obvious obstacle to the accomplishment of this ideal was the diversity of static qualities presented by natural objects. By the simple device of relegating color, sound, smells, tastes, to the mind of the percipient, this obstacle was overcome, and the residual "real" object was left with only properties that lent themselves to mathematical formulation and mechanical explanation. Hence, it was those most interested in the progress of physical science that were most emphatic in declaring the purely mental nature of the "secondary" qualities. Galileo, Descartes, Hobbes, all taught that they are "effects" produced by the real object on the sentient mind, useful as signs to point to powers in the object, but having a purely mental status.

It was the work of Berkeley (*q.v.*) to carry this line of argument into a thoroughgoing idealism. With acumen and vigor he pointed out that to common sense, to the plain man, the real object and the perceived object are identical; that as a matter of fact the so-called primary qualities (extension, resistance, and the spatial-mathematical properties generally) are inseparably bound up with the visible and tangible qualities, and hence that the so-called material real object was but an "abstract" idea. Hence the entire world of known and knowable objects was mental: *esse* equals *percipi*. Berkeley, as a theologian, had no difficulty in attributing the permanent and orderly relations manifested in the world of perceived objects — their "laws" — to the work of divine mind, leading us to expect, in regular and reliable ways, one perception to follow upon another. Hume (*q.v.*), with his antitheological bias, had no difficulty in showing that upon Berkeley's own principles, God, being unperceivable, has no valid status, and that mind itself must be resolved into the simple flux or stream of changing perceptions.

Since his time, idealism has flowed in two separate channels. Empirical, psychological, or subjective idealism has stood for the Berkeleyan resolution of existence into perceptions and their associations, simultaneous and successive — minus, of course, his assumption of spiritual soul substance, divine and human. But since one school of philosophic theory, and upon the whole, the orthodox one, had always attributed slight, or even negative, importance to perceptions as compared with conceptions, in determining the framework of knowledge and in giving certainty, there arose another type of idealism which identified "Reality" with conceptual, or rational, contents; whose motto was *esse* equals *intelligi*. This school of rational idealism is also termed objective realism, because it has taught that thought relations constitute objects independently of relation to any individual percipient, which, as merely individual, is only sentient and hence incapable of general (scientific) knowledge except as it is informed by the same *a priori* or objective reason that constitutes the objective world itself. Its chief motif has been the necessity of permanent and universal relations for the existence of objects of scientific and systematized knowledge, and the identification of these relations with the various functions of rational thought. This type of idealism was introduced by Kant and was carried to its culmination by Hegel, who, however, introduced another and independent conception; that the objective manifestation of mind is found more adequately presented in social life, in the state, and in the historic phenomena of politics, art, and religion than in nature. Schopenhauer, in turn, gave idealism a further distinctive turn by finding the clew to the nature of existence in will rather than in rational thought.

It may almost be said that, barring materialistic and agnostic philosophies, these two types of idealism divided the field between them for a century after Kant. At present, there are many signs that the idealistic movement has, temporarily at least, spent its force. At least, there is a strong realistic tendency in active progress. This movement is too recent and too close to permit of any accurate and just assignment of causes. Some of the main reasons for it are, however, obvious. One is the exhaustion of interests in the type of problems that gave idealism its original impetus. Another is a number of inherent inconsistencies that no type of idealism has completely overcome. Allied to this, is the seeming deadlock between the two kinds of idealism. Moreover, there is a growing feeling that the complete resolution of everything into psychical existence, whether sentient or rational or a fusion of them both (as in Bradley and Royce) in breaking down all distinction between mind and anything else, defeats its own end — that of attributing some distinctive, significant place and efficacy to intelligence in the scheme of existence. Concretely, the most influential force has probably been the development of the doctrine of biological evolution and its evidence that mind, instead of being the sole monopolistic existence, is itself an expression of life, and the means by which life secures its most effective control of the environment in the furtherance of its own active processes. At present, the realistic movement has both a pragmatic and an intellectualistic form, the two agreeing in their common opposition to traditional idealistic systems rather than in a positive body of convictions. J. D.

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See also Baldwin, J. M. *Dictionary of Philosophy and Psychology.* Vol. III, Pt. II, pp. 615–620, for articles in current magazines, etc.

IDEALISM AND REALISM IN EDUCATION. — Two idealistic systems of philosophy have had a peculiarly intimate connection with the theory of education, the Socratic-Platonic movement in antiquity and that of German transcendentalism in recent times. They have also exercised a significant influence upon educational practice. The effect upon practice has not been so much direct as reflex, consisting chiefly in affording a supposed intellectual justification for procedures that originated independently of philosophy. The Platonic idealism, so far as it affected education, was a development of the method pursued by Socrates in his endeavor to arrive at fundamental principles and standards of action. Socrates urged that since no man would voluntarily do violence to his own being or deliberately seek his own harm, ignorance of his own real nature and its proper end, or good, was the source of all evil doing. Moreover, ignorance was the cause of the divisions, the struggles and factions, of civil life. Wherever there is knowledge or true understanding, dispute is impossible; agreement and knowledge are equivalent. The search for knowledge, the process of learning, is, therefore, of necessity a search for that which all men have in common, and which, accordingly, they have a mutual interest in reaching. Argumentative dispute, the desire to conquer in argument, is *ipso facto* evidence of lack of love of wisdom or knowledge. Its opposite, comparison of ideas with a view to discovering their common basis and intent, Socrates called dialectic. Since opinions and beliefs could differ only if they meant to refer to the same thing, a common underlying reality was implied in them.

In the dialectic method there were accordingly three elements: (*a*) The presupposition of an objective universal as the proper subject matter of knowledge; (*b*) the implication of this universal in all particular opinions and beliefs; (*c*) the possibility of its discovery by systematic comparison of particulars. The resultant discovery formed the concept or definition of the object in question — justice or whatever ethical reality might be the object of search. Unless there were such objective universals, the moral anarchy of subjectivism was inevitable; anything was good or right that seemed to be right or good to an individual at any particular moment. The further consequence was social discord and strife, for only an objective universal gave anything common, that is supplied a basis of unity.

Plato extended the Socratic method from moral realities and knowledge of them to all realities and the proper method of knowing them. Knowledge as distinct from private shifting opinions is possible only by virtue of unchangeable substantial universals in which all the particulars of a class participate and through reference to which they can be defined and understood. These objective universals were the Platonic Ideas (*q.v.*) or Forms. Moreover, since all particulars were changing, they were capable of order and uniformity only in the degree in which their changes tended toward their universal. It was then their end, their good, or perfection. Hence true or dialectical knowledge consists in knowing the ends for which natural things exist; a thing without an end is a mere monstrosity.

There are many phases of the Platonic idealism that are reflected in his own educational theory. In fact, education was of central importance in his philosophy, since it was only by a proper method of education that men could become skilled in the use of the dialectic method and be enabled to turn the eye of the soul from the sense appetites and opinions, that correspond to mutable particulars, upon the eternal universal. But a more important consideration for our present purpose is the fact that while the details of the Platonic scheme remained practically without influence, the two chief aspects of his method became firmly embedded in all higher education. These were the setting of dialectical above physical inquiry, and of discussion of final causes above search for efficient causes. Physical science dealt with just the particular and changing things which, according to this philosophy, were relatively unreal; they corresponded only to sense knowledge and mere probability, or opinion. More important was the elaborating and comparing of ideas and beliefs; matters of classification and definition, rather than of observation and experiment. Knowledge of antecedent conditions and constituent (physical) elements was, moreover, held in contempt compared with knowledge of the end or purpose for which things existed. And this latter was a matter of development of meanings rather than of external observation of facts.

That for over fifteen hundred years education followed these lines is too well known to need recording. There is also no need to say that causes quite independent of the Platonic idealism were responsible for the neglect of the physical sciences and mechanical methods of analysis. But the Platonic dialectic as elaborated through the Aristotelian logic furnished the intellectual tools for the entire patristic and scholastic system of education, and the philosophic ideas through which the leading ideas were defended and systematized. Even in the humanistic educational ideal, the feeling that preoccupation with ideas and beliefs is intrinsically more worthy than inquiry into natural existences is to a considerable extent a survival of the dialectic side of classic idealism.

In the general sense of the term, accordingly, Realism in education began with the reaction of the Renaissance period against the supremacy of those forms of subject matter that could be dealt with by pure logic. It contended that such subject matter consisted simply of abstractions at its best, and at worst simply of words. Moreover, since only ideas and beliefs that were already in the mind, or that were already current, could be analyzed, defined, and systematized by purely dialectic method, this method confined men to tradition and authority. In the interest, then, of both reality and mental emancipation, the Realism of the sixteenth and seventeenth centuries called men from ideas to things. Francis Bacon is the great representative of this movement, philosophically; so far as philosophic Realism influenced education it was chiefly through his work. The older methods were, however, too deeply entrenched to undergo much more than slight transformations in externals. The Baconian Realism was but prophetic; there were no well-developed methods of inquiring into fact and no organized subject matter available for educational purposes.

The transcendental idealism of the later eighteenth and early nineteenth century had a symbolic and an institutional form, the former represented in education by Froebel, the latter by Hegel. Both are dominated by the idea of a progressive development or unfolding of a spiritual self-consciousness (which is the principle of totality) in and through the particulars of nature and human experience.

According to romantic (or symbolic) idealism, particulars (especially those approximating mathematical form) are suggestive, illustrative, allegorically symbolic of the absolute truth. Accordingly they may be employed to awaken in the mind of infancy the absolute truth or reality already implicit or latent in it. Froebel's great natural aptitude for perceiving the educative force of plays and games, and modes of occupation was accordingly utilized by him in the interest of a religious, quasi-mystic, quasi-mathematical formalism, the formalism being explained and sanctioned by its supposed correspondence in the realm of feeling and sense with spiritual essence and law in the absolute sphere.

Hegel's idealism was substantially an outgrowth of his opposition to the subjective idealism he attributed to Kant and Fichte. According to him, absolute mind is externalized in physical nature, but truly objectified in social institutions and history. The state is objective reason and will. Only by participating in this realized spirit can the potential mind, latent in individuals, get rational substance or body for what otherwise is a mere empty capacity for consciousness. The unqualified necessity of social institutions as the agencies through which the latent rationality of individuals is to be awakened and developed or brought to full reality, was thus the final lesson of the Hegelian idealism. The accomplishing of this end constitutes education.

Remarkably enough, the great metaphysical realist, Herbart, reached essentially the same conclusion by an opposed route. According to him, there is no one final, all embracing, absolute reality; there is a plurality of reals. Moreover, there is no intrinsic tendency in the individual mind to evolve according to its own inner law into realization of supreme reason or spirit. There is only the capacity to react in a characteristic way to every contact with a real. Education is thus not the growth or development of the mind in accord with its own inner nature, it is a forming or shaping of mind through the presentation of the external reals which operate upon it. The earlier reactions persist as ideas and form the mental material through which all later presentative reactions are received and organized. By controlling the earlier presentations, in terms of which the later are " apperceived " and made effective, we can accordingly control the formation of mind and character, this latter being, indeed, but the complex of patterns formed by past contents as they operate in determining the reception and organization of new contents. In deciding, however, the order and sequence of the presentation of materials, Herbart was almost wholly under the influence of the notion of recapitulation of the culture of the past. As the earlier contents in the history of the individual dominate the assimilation of the later, so these earlier contents are to be assimilated to the culture products of the earlier stages of civilized mankind. Thus, in spite of their radically diverging bases, the Hegelian and the Herbartian systems, as applied to education, agree in the primacy of social material, the former emphasizing the value of institutions, the latter of culture products.

It is out of the question in a matter involving as many important considerations and issues as the idealistic-realistic controversy to do more than point out some of the chief points involved in passing judgment upon it. From the earlier historic division it appears that the question concerns the respective places of meanings and of natural existences in the scheme of experience. From the latter discussion, the issue is seen to have to do with the respective functions of inner development and outer control. If one commenced the investigation of the problem with educational interests uppermost, one's most probable conclusion would be that existence and meaning, internal growth and outer direction, are mutually complementary, not exclusive rivals. As matter of fact, the beliefs of the greatest number of men have always been dualistic rather than exclusively idealistic or realistic. But, again, from the standpoint of that direction of growth of character and intelligence that we call education, what is needed is not a division of the field into separate regions, or into two disconnected kinds of force, but a coöperation of two distinctions which are both relative to the evolution of life and experience. In short, from the standpoint of education, the need is for a philosophy which translates the static divisions of mind and world, inner and outer, that characterize traditional dualisms into dynamic interacting factors of growth, thereby going beyond both traditional idealism and realism. J. D.

See Dualism; Humanism and Naturalism.

IDENTITY — See Self.

IDEOMOTOR (Idea and Motor). — Many active processes are dependent upon ideational processes rather than upon sensory stimulation. These motor processes are said to be aroused through the action of ideas and the processes thus aroused are said to be ideomotor in character. Thus the activity of an insane person may be aroused through the presence of certain fixed ideas (*q.v.*). The significance of the word in psychological discussion is that it draws attention to the fact that many motor processes depend upon central nervous activities and are not dependent upon external sensory stimulations.

C. H. J.

IDIOCY. — The term specifically used to denote the lowest grades of mental defect, although it has been, and unfortunately is still, sometimes used loosely to apply to almost any grade of deficiency. In the definition adopted by the British Royal Commission on the Feeble-minded and agreeing with common usage, an idiot is described as "a person so deeply defective in mind from birth, or from early age, that he is unable to guard himself against common physical dangers," being differentiated on this somewhat economic basis from (1) the Imbecile (*q.v.*) in that the latter, while " capable of protecting himself under usual circumstances, is incapable of earning his living," and from the Feeble-minded (*q.v.*), who, while " capable of earning a living under favorable circumstances," is incapable of " competing on equal terms with his normal fellows."

Classification and Incidence. — For purposes of description idiots are frequently divided into three groups, high, medium, and low grades, although obviously there is no definite line of demarcation between these groups any more than there is between the larger division of idiot, imbecile, and feeble-minded. Sufficient evidence exists for the statement that there is a continuous distribution of cases through all grades of deficiency from the merely dull or stupid person to the lowest grade of idiot.

The following typical classification is employed by the New Jersey Training School for Feeble-minded, " The low-grade idiot is the perfectly helpless child, the middle-grade idiot the one who is able to feed himself, but who eats almost anything, the high-grade idiot, the child who eats with some discrimination, discarding that which is not food." More commonly idiots are divided roughly into two groups, the profound, or complete, and the superficial, or incomplete, and again on the basis of their disposition into apathetic and excitable (Ireland). In the first case " the defect is so profound as to involve the fundamental organic instincts, and even that of sucking is absent " (Tredgold).

Perhaps the most satisfactory classification for general purposes is on the basis of the clinical varieties and characteristics and their etiology. Such a description will apply to all degrees of deficiency. Thus Tredgold, following for the most part the clinical groups proposed by Ireland, first divides deficients into two classes, primary and secondary, according as the deficiency is due in the first instance to hereditary factors, " the results of inherent defects of the germinal plasm " and including probably about 90 per cent of the cases. In the secondary class, including about 10 per cent of the cases, " there is no marked heredity, and no inherent ability to develop, but the growth of some portion or the whole of the brain is interfered with, or arrested, by disease or other adverse environment." These terms, primary and secondary, as thus defined, are proposed as being more accurate than the more usual terms, " congenital " and " acquired."

To these classes a mixed class of cases must, as Shuttleworth and Potts point out, be recognized " in which the actual lesion supervenes upon a brain originally imperfect in development, and to such cases, occurring at a crisis of early life, has been given the name *developmental*.

The chief clinical varieties recognized are (Tredgold): (1) simple amentia corresponding to the " genetous " group of Ireland and presenting " no special distinguishing features other than the anatomical and physiological anomalies to aments in general," and divided according to etiology into porencephalic, sclerotic, and hydrocephalic; (2) microcephalic; (3) mongolian; (4) epileptic (*q.v.*); (5) vascular, toxic, or inflammatory, again subdivided into the three classes given under (1); (6) syphilitic; (7) infantile cerebral degeneration; (8) cretinism (*q.v.*); (9) amentia due to nutritional defect; (10) amentia due to isolation or sense deprivation.

The number of persons classified as idiots depends somewhat on care and method of classification. According to Tredgold there were in England in 1906 " approximately 8654 persons corresponding to 0.25 per thousand of the entire population. The class is thus about one third as numerous as the imbeciles and comprise about 6 per cent of all amounts." As regards sex, there is a small preponderance of male idiots.

Reference should be made to the idiot savants or idiot geniuses. They furnish evidence for the specialization of mental defect. They may be gifted, for example, with unusual memory of one sort or another, — numbers in the case of some of the arithmetical prodigies, in music, art, or craftsmanship, but signally wanting in most, if not all, other respects (F. Peterson, Idiot Savants, in *Popular Science Monthly*, Vol. L, p. 237). For the details of methods of training that have been attempted, beginning with the early attempts of Itard (*De l'Education d'un Homme Sauvage*, 1801) and the notable work of Seguin (*Idiocy and its Treatment by the Physiological Method*, 1866, republished by Teachers College, Columbia University). The reader is referred to these writings and the appropriate chapters in the following selected bibliography. W. F. D.

See DEFECTIVES, SCHOOLS FOR; FEEBLE-MINDED.

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IDIOSYNCRASY. — A characteristic which marks the individual as different from his fellow. See ATYPICAL; GENIUS.

IDIOTS.—See IDIOCY; DEFECTIVES, SCHOOLS FOR.

IDLENESS. — See ATTENTION; INTEREST; SCHOOL MANAGEMENT.

IDO. — See LANGUAGES, ARTIFICIAL.

IGNATIUS OF LOYOLA. — See JESUITS, EDUCATIONAL WORK OF.

ILLINOIS COLLEGE, JACKSONVILLE, ILL. — A coeducational institution founded in 1829 and chartered in 1835. Interested and influential in its foundation was the "Yale Band," consisting of seven men from Yale College, as well as the Presbyterians of the surrounding country. The institution became coeducational in 1903, when the Jacksonville Female Academy and the Illinois Conservatory of Music were merged with it. The requirements for admission are fifteen units. The college grants the degrees of A.B. and A.M. The faculty consists of twenty-one members.

ILLINOIS, STATE OF. — Originally a part of the old North-West Territory. Organized as a separate territory in 1809, and admitted as the twenty-first state in 1818. It is located in the North Central Division, and has a land area of 56,000 square miles. In size, it is a little larger than New York and New Jersey combined; a little smaller than New England, and about the size of England and Wales. For administrative purposes, the state is divided into 102 counties, these in turn into townships, and these into school districts. In 1910 Illinois had a population of 5,638,591, and a density of population of 100.6 persons per square mile. About two fifths of the population of the state is in Chicago and the adjoining residential towns.

Educational History. — The first school of which there is any record was kept in Monroe County, near St. Louis, in 1783, and other schools were opened in neighboring counties before many years. The first schools in Cook County were opened in 1816. (See CHICAGO, CITY OF.) The first constitution in 1818 made no mention of education. The first legislation with reference to schools was in 1819, when the Legislature incorporated three academies, at Edwardsville, Carlyle, and Bellville. The charters of the Edwardsville and Carlyle academies provided for the free instruction of poor children, and, as soon as financial conditions would permit, girls were to be admitted. In 1825 the first general school law was enacted. This provided for common schools in every county, free to all white children, three to twenty-one; for the subdivision of the counties into school districts of not less than fifteen families; and for the election of three trustees for each district by the voters at a called school meeting. The trustees were to examine and hire teachers; to hold and lease property for the schools; and to make an annual statistical and financial report. The support of the schools established was to be derived from local taxation; from the income of the sixteenth section lands and funds; from an apportionment of 2 per cent of all state taxes collected; and from five sixths of the income of the state school fund. Each district was empowered to provide school buildings and equipment, and the clerk of each county commissioner's court was directed to collect and transmit to the Secretary of State the annual school returns. No state, outside of New England, had so advanced a law; the people of Illinois were not educated up to such an advanced conception of education, the law was nullified two years later, and the state lost its chance of educational leadership in the new West. In 1827 the whole or half support of a school by taxation was made optional with the voters of each district, and no man could be taxed for schools without first obtaining his consent in writing. For the next twenty-five years little was accomplished, and church schools furnished the chief means of education for the state. Excepting for a law providing for the election of three Township Trustees and a County School Commissioner to look after the school lands, and the creation of a county school fund in 1835 by depriving teachers of one half of the public money due to them for the year and with it establishing a permanent school fund, nothing whatever with reference to education was done for ten years. In 1837 provision was made for the incorporation of townships, and for five Township Trustees instead of the three School Land Trustees, in case of incorporation. This board of five Trustees was to manage all the schools, and to report regularly to the County Commissioner of their county. Teachers were to be certificated by the Township Trustees before they could receive any public money. In 1841 the school laws were revised, and the 1827 law with regard to taxation was finally repealed. In all townships not organized under the 1837 law the previous provision, requiring three Township Trustees and a County School Land Commissioner, was reinstated; and in addition three School Directors were to be elected for each school district, under either form of township organization. These new officials were to manage the school of their district, to care for the building, to employ the teacher, and to visit the school. This cumbersome method of combined district and township administration has persisted until the present time. In 1840 and in 1843 there was legislation with reference to academies, as these were then being established in numbers. A few were chartered with the specific privilege of receiving state money on the same basis as the public schools, but this plan was never generally adopted. In 1845 instruction in the schools was required to be wholly in the English language, and the people were required to determine annually, in school meeting, whether they would tax themselves to support a school. The limit of local taxation was placed at 15 cents on the $100 (1½ per cent). In 1848 a new state constitution was adopted, but this made no mention of education, further than to provide for the exemption of school property from taxation and to permit the Legislature to invest school districts with the power to assess and collect taxes. It was not until the constitution of 1870 that a separate article on education was inserted. Unlike Indiana, the constitution of Illinois did not pave the way for new features in school administration, but on the contrary merely recorded what had been established previously by legislation and fully accepted by the people.

The first attempt to secure a form of supervision for the schools was made in 1845 by the designation of the Secretary of State as *ex officio* State Superintendent of Common Schools, and the County School Commissioners as *ex officio* County Superintendents of Schools. These *ex officio* County Superintendents were directed to visit and inspect schools, to examine and license teachers, and to make an annual report to the Secretary of State. The Secretary of State, in turn, was to recommend maps, charts, apparatus, and textbooks, to endeavor to reduce to a uniform system the means of supporting schools throughout the state, and to report biennially to the Governor. In 1854 this *ex officio* system was abandoned, and the separate office of State Superintendent of Public Instruction was created to be filled in 1855, and biennially thereafter, by popular election. Until an election could be held, the Governor was to appoint, and the first appointee was to report a bill to the next Legislature which should provide for a free tax-supported system of public education for all the children of the state. The proposed law was accepted by the Legislature of 1856, and marks the beginning of a real state system of schools. Up to this time private and denominational schools had occupied the field; from now on public schools developed rapidly and soon gained the ascendency. The new law defined and enlarged the duties of the State Superintendent; retained the County School Commissioners and changed them into County School Superintendents; retained the previously established township and district school boards; permitted the establishment of district school libraries; provided for a two mill state school tax, to be added to a 6 per cent income from the school funds, and for local taxation; required a six months' term; authorized bonds for school buildings; and abolished the " rate " and made the schools free. This law is the foundation of the present system, no fundamental changes having been made since that time. During the next twenty years, the terms of the State and County Superintendents were changed to four years each; the terms of Township Trustees and District School Directors were so changed as to secure a retiring one third each year; township high schools were authorized; and special laws for city districts were framed. In 1872, 1889, and 1909, the school law was revised, but no fundamental changes were made.

In 1839 a state institution for the education of the deaf and dumb was established at Jacksonville. In 1859 an institution for the education of the blind, and in 1865 an institution for the training of the feeble-minded were also established at the same place. In 1871 a state reform school was established at Pontiac. In 1853 the state teachers' association was formed, and in 1864 a County Superintendents' association was organized.

The new constitution of 1870 was the first to contain a mandate for the establishment and maintenance of a system of public schools. It also safeguarded all permanent school funds; prohibited aid to sectarian or denominational schools; prohibited teachers and school officers from being interested in contracts; and provided for a County Superintendent for each county. The office of State Superintendent is not mentioned in the constitution. Women were first permitted to vote at school elections in 1873. In 1874 a law was passed prohibiting the exclusion of children from any school because of race or color, this law being still in force. In 1857 the first state normal school was established at Normal, and a board of trustees, termed the State Board of Education, was created to manage the school. In 1869 a second school was established at Carbondale, and opened in 1874. In 1867 the Illinois Industrial University (now the University of Illinois) was established at Urbana. In 1869 county normal schools were authorized, and two county normal schools were at once established, one for Cook County (Chicago) and the other for Peoria County (Peoria). Two additional state normal schools were established in 1895, and a fifth such school in 1889. A child labor law was enacted in 1891, and revised in 1903. Kindergarten classes were authorized in 1895; classes for deaf children in 1897; and classes for crippled childen in 1903.

An educational commission was created by the Legislature of 1907 and in 1909 reported a recodification and condensation of the existing school laws; a plan for the establishment of a State Board of Education with sufficient power to enable it to be of real educational service; a plan for County Boards of Education for each county to supervise the schools of the county; a new and graded plan for the certification of teachers, which, had it been adopted, would have given Illinois the best certificating law in the Union; a plan for making the township the unit of organization for schools, and a simplification of the present system of school organization by abolishing the District Boards of Directors; recommendations for the improvement of teachers' institutes; and a minimum salary law providing for minimum salaries of $315 and $385 per year for teachers holding the two grades of teachers' certificates. Only the first measure, the recodification and condensation of the existing laws, could be got through the Legislature, and the chance of finally organizing a strong and efficient state school system was lost. This Commission made a second report in 1911, but no fundamental changes were made in consequence.

Present School System. — As at present organized, the school system of Illinois is as follows: A State Superintendent of Public Instruction, elected by the people for four-year terms, heads the system. There is no State Board of Education, or analogous body, the so-called State Board of Education being merely a Board of Trustees for the State Normal School at Normal. The State Superintendent is required to supervise the public schools of the state; to interpret the school law, decide appeals, and advise school officers as to their duties; to advise County Superintendents as to the construction of school buildings; to grant state certificates to teachers, valid in any county, and to revoke them for cause; to visit the charitable institutions of the state; to prescribe the forms of reports; and to make a biennial report to the Governor. He may also authorize County Superintendents to procure institute instructors; remit forfeitures of the school fund for any failure on the part of districts; require school officers of all kinds to report; and may also request private institutions to make reports. But little power and few functions are assigned to the State Department, and the office is clerical rather than creative.

For each county there is a County Superintendent of Schools elected by the people for a four-year term. There are no County Boards of Education. The County Superintendent is required to look after and sell any township school lands remaining; to visit every school in his county at least once each year; to advise and assist school officers; to conduct a teachers' institute each year, examinations for teachers' certificates each quarter, and examinations for normal school and university scholarships as necessary; to examine the Township Treasurer's bond, and to make an annual examination of his books; to collect fines from the civil authorities and to deposit them to the credit of the school fund; to apportion the state and county school funds to the townships and parts of townships, and to notify the district trustees of the amount distributed; to see that an annual school census is taken by each district; and to make quarterly and annual reports of his acts and visits to the county authorities and annual reports to the State Superintendent. He is also empowered to require reports from all school officers, and to remove district officers for cause; to direct Township Treasurers in the keeping of their books; to renew teachers' certificates without examination, and to revoke them for cause; and to determine disputes among school officials.

Smaller than the county are the Congressional townships, each of which is a school township as well as a civil township. Fractional townships with less than 200 children may be consolidated with adjoining townships. For each township, three Township Trustees are elected, one each year, at the annual April school elections, to hold office for three years each. These Township Trustees must hold semiannual meetings; must apportion the school fund *pro rata* on census to all districts; and must elect a Township Treasurer, for two-year terms, who acts *ex officio* as clerk of the township board. They may also divide the township into districts, and, on petition of the voters, change the districts or consolidate them. The Township Trustees report annually in detail to the County Superintendent, or, in case the township is cut by a county line, to the County Superintendents of both counties. The Township Treasurer has charge of all moneys; keeps all school accounts for the township and the districts; loans the principal of the township funds; makes an annual financial report to the County Superintendent; receives the taxes collected and pays all orders of the school districts; and acts as an overseer of the financial and business affairs of the district school authorities.

For each school district, within the township, the voters must elect a Board of School Directors of three members, for three-year terms, one being elected each year. The Board is required to manage the schools of the district; to determine the studies, apparatus, and textbooks of the schools, and to loan textbooks to indigents; to employ teachers, and to dismiss them for cause; to levy taxes for the support of at least a six months' school in the district, free and equally open to all; to notify the Township Treasurer of the amount levied; to appropriate funds for specific purposes, to borrow money, and to issue bonds; to make an annual report to the Township Treasurer and to the electors of the district at the annual election, and, in case the district lies partly in two townships, to report to both Treasurers. It is with these District Boards of Directors that the chief control of the schools of Illinois rests. Districts having 1000 or more inhabitants, and up to 100,000 are managed by Boards of Education, which have all of the powers granted to District Boards of Directors, and, in addition, the power to maintain schools up to ten months; to examine teachers by examinations supplemental to the county or state examinations; to buy, lease, and condemn school sites; to employ a Superintendent and a secretary; and to print an annual report and course of study. Cities of over 100,000 inhabitants, of which there is only one, are governed by a board of education of twenty-one, appointed by the mayor, and have still larger powers. (See CHICAGO, CITY OF.) Women are eligible to election to any school office, and, if properly registered, may vote at any school election.

The system of school administration in Illinois is still further complicated by the presence of high school boards. Any township, any two or more townships or districts, and any district having 2000 or more inhabitants, may form a high school district, by petition and election. For such high school districts a high school board of five trustees must be elected. The high school district is separate and distinct from the common school district, but may levy taxes and conduct a high school in the same manner as such a district.

School Support. — Illinois originally received 985,066 acres of land from the sixteenth section grant, made by Congress for the support of all schools. This has all been sold excepting 6375 acres. The fund produced by the sale of this land belongs to the township in which the land was located. To this has recently been added the county fund, created by the act of 1835, which amounted in 1906 to $161,703. The combined fund now amounts to about nineteen millions, and is loaned out by the township treasurers for the benefit of the schools of their townships. The state also received 3 per cent of the sale price of government land within the state, for education, five sixths of which went to form the permanent state school fund and one sixth to the college fund. To the five sixths constituting the permanent state school fund was added $335,592.32 from the surplus revenue of 1837, being a little more than two thirds of that received. Both funds were borrowed by the state and spent. They amount, nominally, to nearly one million dollars, upon which the state pays interest at the rate of 6 per cent. This, with a state two mill tax, constitutes the state's contribution, and in 1908 amounted to $896,276.58, or to about 3 per cent of the cost of maintenance of the school system. The interest on the township fund, and the proceeds of fines, forfeitures, and fees, each produced about 3 per cent more. District taxation is the main support of the schools, and produced 88 per cent of the cost of maintenance in 1909. The remainder came from miscellaneous sources. Boards of directors and boards of education in all the school districts of the state, regardless of size, are permitted to levy a local tax of 1½ per cent on their assessed valuation for maintenance, and 1½ per cent for building purposes. Bonds for further sums may be voted by the people. All school money is apportioned to the counties, from the counties to the townships, and from the townships to the districts on the sole basis of the number of children under twenty-one years of age in each subdivision. The income from the township permanent fund is apportioned to the districts on the same basis.

Educational Conditions. — The state is a rich agricultural and manufacturing state, with many railroads and much business. Notwithstanding its large city population, nearly one half of the total population yet live in country districts. Of the total population, about one fifth are foreign born, and about two per cent are negroes. In illiteracy the state had but 4.2 per cent. The educational system of the state is characterized by an excessive development of local management and control, and little centralization in either management or support. Cook County, containing the large and wealthy city of Chicago, with its large expenditure for education and its many excellent schools, and the small, relatively inefficient, and poorly financed rural schools of the black belt of southern Illinois, stand at opposite extremes of the educational system of the state, as well as of the state itself. The 10,613 ungraded schools, with that number of teachers, are supervised by something like 40,000 school officials, not including the county superintendents.

Many districts report themselves as unable to provide a six months school within the limit of taxation allowed by law. One third of the districts were reported as without a library, and 924 of the 13,058 schoolhouses in the state are reported by the county superintendents as unsanitary and unfit. Six hundred and eighteen schools enrolled less than eleven children. The district system has been so strongly intrenched that no laws for the consolidation of schools and the transportation of pupils have so far been enacted, though strongly advocated. Sixty-six schools in the state report kindergartens; 134 as having manual training; 70 as having domestic science; 102 as having special teachers of drawing; 185 as having special teachers of music, and five cities provide day schools for the oral instruction of the deaf. These extra educational advantages are confined almost entirely to the larger cities. The private and parochial schools of the state enrolled 16.6 per cent of the public school enrollment, and in Chicago 35 per cent.

Teachers and Training. — Of the teachers employed 5.3 per cent were college graduates; 7 per cent were normal school graduates; 21.5 per cent had attended some normal school; 14 per cent had not had the equivalent of a high school education; and 10.5 per cent were beginners. Examinations for teachers' certificates are held quarterly in the counties, and two grades of certificates are granted, valid for one and two years respectively and in the county where issued. The standards for these are low. Special certificates may be granted in almost any subject. State certificates, valid in any county, may be issued on examination by the State Superintendent. Cities may superimpose additional examinations for city certificates. As a means of improving teachers in service, an annual county institute of at least five days must be held by each county superintendent, which is free only to the holders of teachers' certificates. For the training of new teachers, the state now maintains five normal schools, all of which in 1910 maintained summer sessions for teachers in service. The city of Chicago also maintains a city normal college, requiring high school graduation for entrance. Entrance to the state normal schools is from the grammar schools, and the course is four years in length. For high school graduates, a two years' course is arranged, and a one year's course is also arranged for those who must teach after one year. In 1907 the legislature authorized the four then existing normal schools to arrange for a degree course of two years of graduate study, leading to the degree of Bachelor of Education. College graduates may obtain the degree in one year, and three eighths of the work may be done *in absentia*.

Secondary Education. — Any school district having a population of 2000 may establish its own high school and elect a high school board of education to manage the school. City boards of education in cities of 1000 or over, may establish high schools as a part of the graded school system of the cities. Any township may by petition and election establish a township high school, and two or more townships, or districts, may unite to form a union high school. On the petition of fifty voters in any high school district, the question of whether or not a manual training department shall be established by the trustees must be submitted for a vote, and if a majority votes in favor of it the trustees must establish such a department. These laws have resulted in the formation of a large number of high schools, there being about 700 in the state at the present time.

Higher and Technical Education. — The University of Illinois (*q.v.*) founded in 1867 as the Illinois Industrial University, and located at Urbana, stands at the head of the public school system of the state. It is one of the largest of our state universities, and offers a wide range of instruction. The state also contains a large number of private institutions of learning.

Name	Location	Opened	Control	For
Hedding College	Abingdon	1853	M. E.	Both sexes
Illinois Wesleyan University	Bloomington	1850	M. E.	Both sexes
Blackburn College	Carlinville	1895	Presbyterian	Both sexes
Carthage College	Carthage	1870	Lutheran	Both sexes
Armour Institute of Technology	Chicago	1892	Non-sectarian	Men
Chicago University	Chicago	1892	Non-sectarian	Both sexes
Loyola University	Chicago	1870	R. C.	Both sexes
De Paul University	Chicago	1908	R. C.	Men
James Milliken University	Decatur	1903	Presbyterian	Both sexes
Austin College	Effingham	1891	Non-sectarian	Both sexes
Eureka College	Eureka	1855	Christian	Both sexes
Northwestern University	Evanston	1851	M. E.	Both sexes
Ewing College	Ewing	1867	Baptist	Both sexes
Knox College	Galesburg	1837	Non-sectarian	Both sexes
Lombard College	Galesburg	1852		Both sexes
Lake Forest College	Lake Forest	1876	Non-sectarian	Both sexes
McKendree College	Lebanon	1828	M. E.	Both sexes
Lincoln College	Lincoln	1865	Presbyterian	Both sexes
Monmouth College	Monmouth	1856	Un. Presbyterian	Both sexes
Northwestern College	Naperville	1861	Evang. Assoc.	Both sexes
St. Bede College	Penn	1891	R. C.	Men
Rockford College	Rockford	1849	Non-sectarian	Women
Augustana College	Rock Island	1860	Lutheran	Both sexes
Concordia College	Springfield	1856	Evang. Luth.	Men
St. Joseph's College	Teutopolis	1862	R. C.	Men
Shurtleff College	Upper Alton	1827	Baptist	Both sexes
University of Illinois	Urbana	1867	Non-sectarian	Both sexes
Westfield College	Westfield	1865	United Brethren	Both sexes
Wheaton College	Wheaton	1860	Congregational	Both sexes

In addition to professional departments maintained by the larger of the above institutions, there are also five independent theological schools, four independent law schools, and five independent medical schools, nearly all being located in Chicago.

Special Institutions. — The state maintains the following special institutions for the education of defectives: the Illinois School for the Blind, at Jacksonville; the Illinois School for the Deaf, at Jacksonville; the School of the Soldiers' Orphans Home, at Normal; the State Training School (Reformatory) for Girls, at Geneva; the Illinois State Reformatory for Boys, at Pontiac. E. P. C.

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ILLINOIS, UNIVERSITY OF, URBANA, ILL. — An institution founded by the state as a land grant college in pursuance of the act of Congress of 1862. The institution was incorporated in 1867 as the Illinois Industrial University, and opened to students in 1868. At first labor on the farm was made compulsory, but was soon discontinued. In 1870 shop instruction in the mechanics was introduced for the first time in an American university. Women were admitted in the same year. The university received legislative authority to grant degrees and diplomas in 1877, and in 1885 the present title was adopted. In 1896 the Chicago College of Pharmacy became the School of Pharmacy of the University of Illinois, and in 1897 a school of law, known since 1900 as the College of Law, was opened. In 1897 the College of Physicians and Surgeons of Chicago became the College of Medicine of the University of Illinois. In the same year the State Library School was opened at the university. In 1901 the School, now the College, of Dentistry, was organized. The School of Railway Engineering and Administration was established in 1907. Courses in business administration had already been introduced in 1900. The government of the institution is in the hands of a board of nine trustees elected for six-year terms, and the Governor of the state, the President of the State Board of Agriculture, and the Superintendent of Public Instruction *ex officio*. Students are admitted by certificate from an accredited high school or by examination. The entrance requirements are fifteen units. In addition to the schools mentioned above, a summer session and agricultural experimental station are maintained. The enrollment of students in 1909–1910 was 5118, distributed as follows: graduates, 283; arts, 880; science, 297; engineering, 1303; agriculture, 628; library, 31; music, 61; academy, 334 (discontinued, 1911); summer session, 313; law, 193; medicine, 526; dentistry, 108; pharmacy, 174. The faculty at Urbana includes 140 members of professorial grade and 368 junior instructors and assistants. Edmund Janes James, Ph.D., LL.D., is the president.

ILLINOIS WESLEYAN UNIVERSITY, BLOOMINGTON, ILL. — A coeducational institution founded in 1850 and comprising four departments, an academy, college of liberal arts, college of law, college of home economics, school of fine arts, and school of music and oratory. The requirements of admission are fifteen units. The four courses, classical, Latin-scientific, scientific, and English, lead to degrees of A.B. and B.S. A high school education is required of candidates who wish to enter the college of law, which confers the degree of Bachelor of Laws at the end of a three years' course. Of the 737 students enrolled in 1910–1911, 241 were taking work in the college of liberal arts. The faculty consists of 42 members.

ILLITERACY. — A term used to denote the inability to read and write in any language, and applied to those ten years of age or over. In a few foreign countries, and in a very few American states, statistics are also collected which segregate those unable to read the language of the country from the literate, and as an intermediate class. Classified statistics as to illiteracy have been collected by the United States Census decennially since 1840, and similar statistics are compiled and published at intervals by most other nations. The ability merely to read and write represents a very elementary test, and many who are able to pass it are still illiterate in almost every other than the technical sense of the term. Nevertheless, the ability to read and write distinguishes those who may learn and improve their minds from papers and books from those who are shut off from this source of knowledge. Thus, the percentage of illiteracy to be found in a state or nation is to a very large degree an index of the extent to which the advantages of elementary education have been provided for the people by the government.

Illiterate people should be classified as to age, sex, nationality, and race to exhibit the existing conditions in any intelligent manner. Illiteracy under the age of ten is generally neglected in all educational statistics, so that little can be told, except in cities where a good school census is taken, as to the degree to which compulsory education laws are enforced during the early school period. The next measure of illiteracy, after the total number ten years of age or over, is usually the percentage of the voting population which is illiterate. This is higher than the former, as it includes a larger percentage of older persons. Statistics for those who have passed certain age periods, such as forty or fifty years of age, show a still further increase in the percentage of illiteracy. Classified by sex, the illiteracy of females nearly always exceeds that for the males of the same age, race, or nationality, except that it is less in the United States for the age period of ten to twenty-four years. In some Catholic countries, and in all Mohammedan and Asiatic countries, the illiteracy of the females is markedly higher than among the males. In Turkey, India, and China we find a high illiteracy among the males, and an almost complete illiteracy among the females.

The least illiteracy to-day is to be found among the people in the countries to the north and west of Europe, and of Teutonic or mixed Teutonic stock. It was in these countries that the Protestant revolt made its greatest headway, and the ability to read the word of God and to participate in the church services were regarded as of great importance for salvation. The lowest percentage of illiteracy to-day is found among the Teutonic nations (the German states, Sweden, Norway, Denmark, and Finland), the Mixed Teutonic nations (Switzerland, Scotland, the Netherlands, and England), and in France. As we go to the south and east of Europe, the percentage of illiteracy increases rapidly, reaching its highest points in Spain and Portugal in the one direction, and in Russia, Servia, and Roumania in the other. Greece, Italy, and the different states of the Austro-Hungarian Empire also have a high percentage of illiteracy.

Various methods are, however, employed to discover the number of illiterates in different countries. In Great Britain it is usual to compile statistics of illiteracy from the number of those who sign the marriage registers by mark; a supplementary test is also afforded by taking tests among the army and navy recruits. On the Continent the statistics of illiteracy are drawn mainly from the conscripts for the army.

In both tests the statistics are of course true only of people at a certain age. In the United States the census accepts a declaration of each person as to his or her literacy. How varying the basis of calculation is shown by the following table, in which the term "illiterate" includes all persons unable to write their own language, except in the case of countries marked with an asterisk, where illiteracy is based on inability to read:—

Country	P. C. Illiterate	Basis	Year
Europe:			
Austria	26.2	Population over 10 yr.	1900
Belgium	18.6	Population over 10 yr.	1900
Belgium	8.5	Army recruits	1908
Bulgaria	65.5	Population over 10 yr.	1905
Bulgaria	58.4	Marriages	1901–1910
Denmark	0.2	Army recruits	1907
England and Wales	1.8	Marriages	1901–1910
Finland [1]	1.5	Population over 15 yr.	1900
Finland	4.9	Army recruits	1899
France	14.1	Population over 10 yr.	1906
France	3.5	Army recruits	1904
France	4.1	Marriages	1901–1910
German Empire	0.03	Army recruits	1905
Great Britain	13.52	Army recruits	1907
Greece [1]	57.2	Population over 10 yr.	1907
Greece	30.0	Army recruits	No date
Hungary [2]	40.9	Population over 12 yr.	1900
Ireland	17.4	Population over 10 yr.	1901
Ireland	8.1	Marriages	1901–1910
Italy	48.2	Population over 10 yr.	1901
Italy	30.6	Army recruits	1905
Italy	38.7	Marriages	1901–1910
Maltese Islands [3]	57.5	Population over 5 yr.	1901
Netherlands (The)	1.4	Army recruits	1908
Netherlands (The)	2.2	Marriages	1901–1910
Poland	59.3	Population over 10 yr.	1897
Portugal	73.4	Population over 10 yr.	1900
Prussia	0.06	Army recruits.	1903
Prussia	0.4	Marriages	1901–1910
Roumania	61.2	Population over 7 yr.	1909
Roumania	64.5	Army recruits	1908
Russia	70.0	Population over 10 yr.	1897
Russia	61.7	Army recruits	1894
Scotland	1.6	Marriages	1901–1910
Servia	78.9	Population over 11 yr.	1900
Servia	36.7	Marriages	1901–1910
Spain	58.7	Population over 10 yr.	1900
Sweden	0.3	Army recruits	1907
Switzerland	0.5	Army recruits	1905
United Kingdom	1.0	Army recruits	1903-04
America:			
Continental U. S., total population	7.7	Population over 10 yr.	1910
Native white, native parents	5.7	Population over 10 yr.	1910
Native white, foreign parents	1.6	Population over 10 yr.	1910
Foreign born white	12.8	Population over 10 yr.	1910
Negro	30.5	Population over 10 yr.	1910
Indian	56.2	Population over 10 yr.	1900
Chinese	29.0	Population over 10 yr.	1900
Japanese	18.2	Population over 10 yr.	1900
Argentina	54.4	Population over 6 yr.	1895
Bolivia	82.9	Population over 7 yr.	1900
Brazil	85.2	All ages	1890
America — *Cont.*			
British Honduras	68.8	All ages	1901
Canada	17.1	Population over 5 yr.	1901
Chile	49.9	Population over 10 yr.	1907
Costa Rica	80.2	All ages	1892
Cuba	56.8	Population over 10 yr.	1899
Guatemala	92.7	All ages	1893
Mexico	75.3	Population over 11 yr.	1900
Newfoundland	45.8	Population over 5 yr.	1901
Peru	86.5	All ages	1876
Porto Rico	79.6	Population over 10 yr.	1899
Australia:			
New South Wales [4]	4.9	Population over 10 yr.	1901
New South Wales	1.0	Marriages	1901–1910
New Zealand [5]	1.7	Population over 10 yr.	1906
New Zealand	0.3	Marriages	1901–1910
Queensland [6]	10.6	Population over10 yr.	1901
Queensland	2.0	Marriages	1901–1910
South Australia [4]	4.5	Population over 10 yr.	1901
South Australia	0.8	Marriages	1901–1910
Tasmania	6.7	Population over 10 yr.	1901
Tasmania	2.4	Marriages	1901–1910
Victoria [7]	3.2	Population over 10 yr.	1901
Victoria	0.4	Marriages	1901–1910
Western Australia [8]	4.4	Population over 10 yr.	1901
Western Australia	0.6	Marriages	1901-10
Asia and Oceania:			
Ceylon (All races)	78.3	All ages	1901
Ceylon (European race)	11.9	All ages	1901
Ceylon (Other than European	78.4	All ages	1901
India	92.5	Population over 10 yr.	1901
Philippine Islands [9]	55.5	Population over 10 yr.	1903
Russia [10]	87.3	Population over 10 yr.	1897
Hawaii	36.3	Population over 6 yr.	1896
Africa:			
Algeria	7.7	Army recruits	1909
Cape of Good Hope (All races)	65.8	Population over 10 yr.	1904
Cape of Good Hope (European race)	6.2	Population over 10 yr.	1904
Cape of Good Hope (Other than European race)	86.2	Population over 10 yr.	1904
Egypt [1]	92.7	Population over 10 yr.	1907
Natal (European race)	2.0	Population over 10 yr.	1904
Orange River Colony (European race)	7.3	Population over 10 yr.	1904
Orange River Colony (Aborigines)	90.6	Population over 5 yr.	1904
Orange River Colony (Mixed and other colored)	85.9	Population over 5 yr.	1904
Transvaal (European race)	3.9	Population over 10 yr.	1904

In the United States a very determined campaign has been waged against illiteracy during the past thirty years. The relatively high percentage of illiteracy among the native whites living in the rural districts of some of the older states; the very high percentage of illiteracy among the colored race in the Southern states; the marked illiteracy among the Mexican element in the southwest; the great influx of foreigners into the cities and states of the North Atlantic and North Central groups of states, and particularly the rapid shift in immigration from the north and west of Europe to the south and east, after about 1880; and the increasing state and national consciousness that an illiterate population is a national danger, — all alike have tended to stimulate the American states in their efforts to abolish illiteracy from among them. Great headway has been made in the Southern states not only in reducing the illiteracy among the colored population, but among the poor native whites as well. The history of education in the different Southern states (see articles on the different Southern State School Systems, ALABAMA, ARKANSAS, FLORIDA, etc.) during the past thirty years is in large part the story of a battle to reduce the illiteracy of their people, to provide elementary educational advantages for all, and to enact and enforce some form of compulsory education and child-labor laws. Arizona and New Mexico have also made commendable progress in reducing the illiteracy of the Mexican portion of their populations. (See articles on the school systems in these states.) In the states of the North Atlantic and the North Central groups of states the efforts to reduce illiteracy have been seriously interfered with by the great immigration of foreign elements, coming largely from countries where illiteracy is high and where primary education is but poorly provided for. The French Canadians from Canada have caused much concern to the mill towns of New England. Similarly the great influx of South Italians, Greeks, and Russian and Polish Jews into the cities, and of Magyars, Slovaks, Lithuanians, Poles, and other nationalities from the south and east of Europe into the mining regions and manufacturing towns of the Northern and Eastern states, have caused much concern there. Schools have been increased in numbers and improved, educational advantages have been multiplied, and in cases extended to the parents also, and compulsory education and child-labor laws have been enacted, revised, and enforced. The results of all of these efforts, in the different parts of the country, has been a marked reduction in the percentage of illiteracy, considered as a total or by states as wholes. But owing to the growth of the country the total number of illiterates has a little more than held its own during the past forty years. (For full detailed figures, by states and for the decennial periods, as well as by race, sex, and ages, see the *Reports of the United States Census*. The Thirteenth Census, for 1910, gives the latest figures available.)

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[1] No definition of "illiterate" is given in the census report.
[2] Including Croatia and Slavonia.
[3] Native Maltese population.
[4] Excluding aborigines.
[5] Excluding Chinese.
[6] Excluding nomadic aborigines.
[7] Including Chinese and aborigines.
[8] Excluding full-blooded aborigines
[9] Civilized population
[10] Caucasia, Siberia, and Central Asia.

An analysis of the figures contained in these reports gives the following results: In thirty years the percentage of illiterates, ten years of age or over, has been cut in two (17.0 per cent in 1880; 13.3 per cent in 1890; 10.7 per cent in 1900; and 7.7 per cent in 1910). The percentage of illiteracy among the female sex is still slightly greater than for the males, though it has been reduced much more rapidly. Among persons between the ages of ten and twenty-five, however, the percentage of illiteracy among the females is less than among the males. The percentage of illiteracy among the negroes is still high (30. 5 per cent in 1910), though this has been more than cut in half during the past thirty years. The large percentage of illiterates among the colored race in a few of the old slave states raises the average for the race above what it would be for most of the Southern states. Among the white population alone, the percentage of illiteracy has been nearly cut in two also during the past thirty years (9.4 per cent in 1880; 7.7 per cent in 1890; 6.2 per cent in 1900; and 4.9 per cent in 1910). This high average for the country as a whole is the result of adding in the large number of illiterates of foreign birth (native-born whites, 3.0 per cent; foreign-born whites, 12.8 per cent), just as the large number of illiterates among the native-born population is the result of adding in the illiterates of the colored race.

Illiteracy among children has decreased greatly everywhere, and illiteracy is less prevalent in the cities of 25,000 population and over, despite their large foreign-born element, than in the small towns and country districts. The percentage of illiterates among the children of native-born parents is, strange to say, much greater than among the native-born children of foreign-born parents. In the Southern states there are relatively few foreign-born people, and the problem of illiteracy is among the negroes and poor whites. In the Northern and Eastern states there are relatively few negroes, but a large foreign-born population, so that the problem there is among the foreign-born in the cities and the native whites of the rural districts. In the western part of the North Central Division the foreign-born is largely from the north and west of Europe and largely Teutonic in stock, the rural schools are good, and the percentage of illiteracy is the lowest to be found in the United States. Kansas, Nebraska, Iowa, Minnesota, and the two Dakotas are situated in this group, and all have a very low percentage of illiteracy. In the mountain and Western states, if we omit a relatively small number of Indians, the illiteracy is almost entirely among a foreign-born mining and agricultural element in the population.

One significant thing about the tables published, when analyzed closely by states, is the growing illiteracy in the villages and rural sections of a number of the states, particularly the older states. This is partly due to the incoming of a cheaper foreign-born agricultural laborer, and in part to the inefficiency of the rural school and the lack of the enforcement of compulsory education laws by country people. The first is one which is likely to cause the illiteracy of country districts to increase rapidly during the next few decades. As scientific agriculture, carried on on both an extensive and an intensive scale, takes the place of the old style of farming, the size of farms and the number of large farms worked by a scientific agricultural superintendent and cheap foreign labor may both be expected to increase. The problem of education in rural communities will become more and more acute, and the need of a reorganization of rural education along rational administrative lines will be increasingly felt. (See article on Rural School Problem.)

The idea of free schools for all, supported by the taxation of all, is an expression of the fear of an ignorant citizenship. As the problems of government increase in number and complexity, and as the franchise is extended to new peoples and in new directions, the national peril of an ignorant and an untrained citizenship is felt with increasing force. The good of the community and of the State, as much as of the individual, demand as high a general level of intelligence on the part of the masses as is within reasonable attainment, and nowhere is this more forcibly pushed upon the attention of statesmen than in a democracy such as our own. The deeper this conception takes hold of the national consciousness, the more marked will be the tendency not only to stamp out illiteracy in the usual technical sense of the term, but to insist upon the attainment of at least the rudiments of a common-school education before the child is allowed to leave the school and begin work. The recent tendency of our American states to revise their compulsory education laws so as to require attendance at school every day that the schools are in session, the extension of the compulsory education period from fourteen to sixteen, and the Massachusetts insistence upon the ability to undertake the work of the fourth school grade to be considered able to read and write, are all tendencies in this direction. The German and French requirements of the completion of certain grades of work before leaving school are similar illustrations of this tendency. E. P. C.

See also articles on Attendance, Compulsory; Child Labor; Childhood, Legislation for the Conservation and Protection of; and Leaving Certificates. For the last available statutes on illiteracy in any country or state, see the article on the school system of that country or state.

ILLUSION. — In many cases the process of perception is so disturbed by the conditions under which it takes place that the resulting image or mental process is not adequate as a representative of the external object from which the percept was derived. Thus if for any reason one sees an object as very small when he should see it as large, an illusion is said to arise. Such an illusion occurs when we look upon human beings from a great height. If we looked at them at the same distance in a horizontal direction, we should see them as larger than when we look down upon them from above. The contrast between two such cases of perception makes it clear that one or the other of these percepts is not adequate to represent the external object. Simple geometrical figures illustrate very clearly what is meant by an illusion. Figure I shows two horizontal lines which are of exactly the same length. The additional oblique lines, however, so disturb the process of perception that we are unable to recognize the two horizontal lines as equal to each other. In Figure II the long lines are parallel to each other, but the intercepting oblique lines so disturb perception that we see the long lines as converging and diverging, not as parallel.

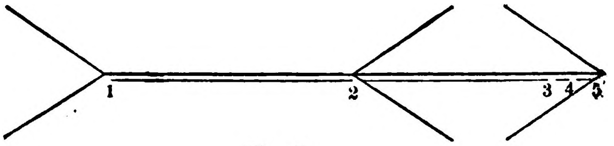

Fig. I.

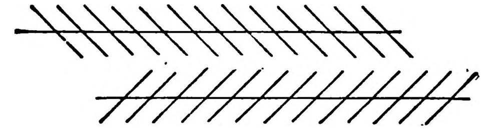

Fig. II.

The reason why these illusions persist in adult life seems to be that there is no motive which would lead us to overcome them. Indeed, the motive is in some cases very strong for the maintenance of certain regular, typical forms of interpretation which are illusory. Thus, it is an illusion when we see a reflected object behind the mirror, but this illusion is due to the general perceptual habit of recognizing all objects as placed in the direction from which light comes, and it would be disastrous to our mental life to overcome this natural perceptual habit. The presence of the illusions is not a large consideration in educational discussions so long as we deal with the practical side of school work. For purposes of scientific study of perception, however, illusions lend themselves as very helpful instances of complexity which are capable of ready analysis and experimental study. C. H. J.

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Judd, C. H. *Genetic Psychology for Teachers,* Chap. I. (New York, 1903.)

Sanford, E. C. *A Course in Experimental Psychology.* (Boston, 1894.)

ILLUSTRATIVE DRAWING. — In the kindergarten and the primary grades drawing is used as a means of expression, paralleling speech, dramatization, song, and play, and preceding written composition. The drawing is kept spontaneous both in selection of fact and invention of form, no direct method being used to improve the form and technique chosen by the child to illustrate, exposit, or narrate his meaning. Later when he begins to write, the making of illustrative pictures accompanies his written compositions. This spontaneous drawing frequently goes under the term "illustrative drawing." H. S.

See Drawing.

IMAGE. — A term used in general to describe the experience which one has when he remembers anything. Primarily the term is applied to visual memory. Thus one has the image of a face which he recognized yesterday. Secondarily the term is carried over to refer to auditory and tactual memories and all other recalled experiences. Thus one is said to have an auditory image of the word which he heard an hour ago. Images have different degrees of vividness, completeness, and assertiveness. Thus certain individuals see clear visual reproductions whenever they try to recall their past visual experiences; others have very dim reproductions. An image may lack certain of the elements which the original percept contained. Thus one recalls a building, but is quite unable to supply in his image the details of architectural devices which he originally saw. Finally, one may have an image which haunts him and demands his attention, while on the other hand he may be able easily to set aside the experience as a mere trivial memory. In ordinary usage the term "image" is broadly synonymous with the term "idea." More strictly employed, the image is only one phase of the idea, namely, the content phase, whereas the term "idea" (*q.v.*) refers to the general processes of comparison present in all complex thought.

C. H. J.

See GENERIC IMAGE; IMAGINATIONS; MEMORY.

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GALTON, SIR F. *Inquiries into Human Faculty.* (New York, 1883.)
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IMAGELESS THOUGHT. — The use of this expression has lately arisen in psychology in protest against the doctrine that thinking and all conscious processes are composed entirely of sensory images, along with present sensations. Thought was regarded as a combination or sequence of pictures, either visible to the "inner eye," or audible to the inner ear, etc.; and the practical inference was sometimes drawn that the way to develop thinking power is to cultivate the powers of imagery. When Galton found that good thinkers were often deficient in powers of imagery, at least of visual imagery, doubt was thrown on the image doctrine. It had to be admitted that the image was often a very inadequate picture of the object of thought. The conception of *meaning* (*q.v.*) now arose; an image, however imperfect as a picture, might symbolize or stand for a thing or fact, and serve the purpose of thought as well as a complete and highly colored mental picture. The meaning was the important thing from a practical point of view, but was supposed to be very elusive in consciousness, so that introspection would show only the images with vague halos of meaning and intangible feelings of the tendencies of the image. In consciousness the image was still supposed to be the prominent feature. But recent experimental studies, in which the effort has been made to describe what is present in mind during actual thinking processes, have found that oftentimes the meaning is clear and prominent in consciousness, while the image, if present at all, is so elusive as to escape detection. Such "imageless thought" is now an admitted fact in some individuals. Whether it is an ultimate fact, as some contend, or whether it is to be explained away as due to a blending of many obscure images, or whether it is composed of sensations of muscular tension and movement (which are sure to accompany any thinking activity), or whether it is a nearly unconscious and automatic process, resulting from previous training in thinking on a given subject, — all these alternatives are still open, as the psychology of thinking stands to-day. From the practical point of view, it would certainly seem that the cultivation of imagery — however valuable this may be on its own account — is not to be regarded as essential to the development of powers of thinking. What is essential is the ability to grasp meanings and relations, and this may best be made the direct object in view — success being tested by ability to handle meanings and relations rather than by ability to handle images.

R. S. W.

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IMAGERY. — See IMAGE; IMAGELESS THOUGHT; IMAGINATION; MEMORY; also EYE- AND EAR-MINDEDNESS.

IMAGINARY NUMBERS. — See COMPLEX NUMBERS.

IMAGINATION. — This term is employed to indicate that the content of consciousness is made up of images derived from past experiences. In view of the fact that human conscious experience deals very largely with visual content, the word "image" is appropriate in the description of most processes. Imagination is related to memory. In memory the image is an exact reproduction of the earlier experience, or in so far as it departs from the exact reproduction of the earlier experience, it is defective. On the other hand, in imagination memory images are more or less readjusted. Elements of a number of different memories may be brought together in a single new image. Thus, one may construct an imaginary scene in which a number of different actors are brought together. These different actors may each of them be remembered characters, but the whole scene will be an imaginary scene in the sense that these particular persons were never presented simultaneously in experience.

The power which an individual has of thus rearranging his ideas is undoubtedly a very late product in animal evolution. The higher forms of animal life undoubtedly have memory images, but they do not have the power of working over these memory images into new combinations. The behavior of animals goes to indicate that they never succeed in thinking of new combinations which they may work out in the environment. New combinations in the environment, as appear in the human construction of machinery, indicate a very high development of the power of imagination. For these recombinations of material objects must be anticipated by some recombinations of ideas in the mind. The earlier stages of imagination appear in mythology. Here primitive man, impelled by his desire to explain nature, brought together ideas which are not presented in this combination in his actual experience. Such primitive imagination may be described as mental play. The myths which resulted were of importance not merely in satisfying the momentary demand for an explanation of given phenomena, but they also cultivated the power of mental recombination and furnished the experience out of which grew the principles by which the products of imagination could be criticized; for as soon as primitive man began to consider explanatory systems of ideas he found himself in conflict with others who had made similar efforts to imagine explanations, and each thinker was thus impelled to work out these combinations of ideas which would most validly represent the external conditions. He ultimately became critical of his own imaginations, and abandoned the mythical explanation for a more scientific investigation of the facts. This scientific investigation required, no less than the earlier mythological explanation, a recombination of ideas. But this recombination of ideas was undertaken more critically than the primitive imaginations.

There grew up as a result of this more critical type of intellectual effort what is known as scientific imagination. The scientist has no hesitation in combining ideas in a form which is not immediately suggested by direct observation. Thus in modern physics, light is explained as a system of vibrations and is usually illustrated in classroom work by various gross forms of wave motion which are explained to the student to be representations which he may use in constructing an imaginary picture of what actually goes on when light travels through space. The student is warned during such demonstrations that the pictures which are furnished to him are not exact representations of light vibrations, but merely material which he may use in constructive thinking.

The importance of such constructive thinking for human mental life is unlimited. As soon as man learned to recombine his ideas through imagination, he gained a power over his external environment which he could not have so long as his images were merely reproductions of past experiences. He could now bring together, first in thought and afterwards in a practical way, elements of his experience which nature would never bring together. He could plan a complete transformation of his surroundings. He could lay out a plan reaching into the future and involving combinations that no individual has ever seen.

Children are sometimes said to be more imaginative than adults. The statement in this unqualified form is not justified by a study of mental development. Mental development progresses in the direction of more and more active recombinations of experiences. Greater activity in this case does not mean that the individual is likely in the later stage of mental life to make more fantastic combinations of experiences. For example, the adult who is acquainted with the laws of zoölogy cannot imagine a dragon with the same confidence that a child imagines a dragon breathing fire. The adult is limited in his possibilities of imagination because he knows that animal tissue would be injured by contact with fire. In this sense, therefore, his imagination is restricted by his larger experiences. On the other hand, the adult is capable within the limits of his knowledge of physics and chemistry of thinking of more combinations than the child could possibly imagine. He may work out the mechanical principles of physics in a great variety of different kinds of imagery. He has freedom, therefore, to make mental combinations according to certain laws of experience. Indeed, he may for purposes of fiction abandon some of the rigid laws of physics which he knows. He may for example think of various types of flying machines which he knows could not be actually constructed. When such fantastic imaginations are indulged in by adults, they give pleasure and amusement, but they do not attract the same type of belief that they do in young children. The principles of criticism here operate to protect the adult from any serious consideration of his fancies. The term "fancy" is used to mark off these imaginations which are free and amusing, but are not undertaken for serious practical purposes. In the child there is a confusion between fancies and serious imaginings, because the child is not supplied with the canons of criticism which the adult possesses.

Adult imaginations are accordingly more critical, while they are at the same time more numerous and more varied in type. Imaginations may be classified from various points of view. Literary imagination is that type of imagination in which combinations of characteristics and events are worked out for purposes of entertainment or instruction. Scientific imagination is that type of imagination in which the forces of nature are thought of for purposes of explaining phenomena. Mechanical imagination is that type of imagination which is exhibited by the inventor.

The cultivation of the imagination is undoubtedly an important part of the work of the school. There is danger in school instruction that the child's efforts to make combinations of ideas will be unduly suppressed by the critical teacher. The child whose combinations of ideas are thus suppressed is likely to lose the tendency which he naturally exhibits, because he will regard criticisms as unfavorable to all activity of the imagination. The skillful teacher should lead the child to recognize the value of constructive, critical imagination as distinguished from mere fancy. There should be no abatement of the power to recombine ideas in the forms other than those which are dictated by actual experience, but there should be a gradual increase in the critical power which the child exhibits in the examination and classification of his own imaginations. Where the child shows a disposition to use only one type of mental imagery, he should be encouraged to broaden the scope of his imagination. (See Eye- and Ear-Mindedness.) The practical interest which the individual attempts to work out constitutes a strong incentive for the cultivation of imagination, for whenever a person is trained to attack intelligently a new situation, he will naturally fall into the way of planning beforehand for this situation. Planning in advance is always a form of imagination.

C. H. J.

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James, W. *Principles of Psychology*, ch. xviii. (New York, 1890.)

IMBECILES, EDUCATION OF. — See Defectives, Schools for; Idiocy.

IMBECILITY. — A term used to describe a degree of mental deficiency severer than that of the feeble-minded (*q.v.*), but superior to that of the idiot (*q.v.*). According to the definition accepted by the British Royal Commission on the care and control of the feeble-minded, imbeciles are "persons who are capable of earning a living under favorable circumstances, but are incapable from mental defect existing from birth or from an early age (*a*) of competing on equal terms with their normal fellows; or (*b*) of managing themselves and their affairs with ordinary prudence."

From the institutional standpoint the group ranges from the child "who plays a little and tries to help but can do nothing alone, to those who can do simple tasks of short duration, such as washing dishes, scrubbing floors, or sweeping" (Goddard). Because of the frequency of moral weakness and deficiency among imbeciles, they are commonly grouped also according to the degree of moral sense, as moral imbeciles of high, middle, or low grade. See Idiocy.

Tredgold estimates that the number of imbeciles (in England) corresponds to 0.73 per thousand of the population, being about "half as numerous as the adult feeble-minded, and about three times as numerous as idiots." There is a slight preponderance of the male sex.

W. F. D.

See Defectives, Schools for.

Reference: —

See under Defectives and Idiocy.

IMITATION. — The term is used in ordinary language to designate any repetition of any act or thought which has been noted by an observer. Thus, one imitates the facial expression of another, or his mode of speech. The term has been brought into prominence in scientific discussions through the work of Gabriel Tarde, who in his *Les Lois de l'Imitation* points out that imitation is a fundamental fact underlying all social development. The customs of society are imitated from generation to generation. The fashions of the day are imitated by large groups of people without any consciousness of the social solidarity which is derived from this common mode of behavior. There is developed through these various forms of imitation a body of experiences which is common to all of the members of a given social group. In complex society the various imitations which tend to set themselves up are frequently found to be in conflict; thus the tendency toward elaborate fashions in dress is constantly limited by the counter-tendency toward simpler fashions. The conflict of tendencies leads to individual variation from the example offered at any given time, and, as a result, there are new examples to be followed. Complex social examples are thus products of conflict.

This general doctrine of Tarde has been elaborated by a number of recent writers. Royce calls attention to the fundamental importance of imitation as a means of social inheritance. The same doctrine is taken up by Baldwin in his *Mental Development in the Child and Race*, and in *Social and Ethical Interpretations*. With these later writers, imitation takes on a significance which is somewhat technical and broader than the significance which it has either with Tarde or in the ordinary use of the term. Baldwin uses the term to cover that case in which an individual repeats an act because he has himself gone through the act. In such a case, one imitates himself, and sets up what Baldwin terms a circular reaction. The principle of imitation is thus introduced into individual psychology as well as into general social psychology, and the relation between the individual's acts and his own imagery is brought under the same general principle as the individual's responses to his social environment. The term "imitation" in this broader sense is closely related to the processes which are described under Sympathy (*q.v.*).

The term "social heredity" has very frequently been used in connection with all of the processes here under discussion. Society tends to perpetuate itself in the new individual in a fashion analogous to that in which the physical characteristics of the earlier generation tend to perpetuate themselves in the physical characteristics of the new generation. Since modes of behavior, such as acts of courtesy, cannot be transmitted through physical structure, they would tend to lapse if they were not maintained through imitation from generation to generation. Thus, imitation gives uniformity to social practices, and consequently is to be treated as a form of supplementary inheritance extending beyond physical inheritance, and making effective the established forms of social practice. C. H. J.

See SYMPATHY; SOCIAL HEREDITY.

Imitation in Education. — Large reliance upon imitation in education has been defended upon two grounds, one psychological, the other sociological. Psychologically, it is claimed that out-of-school experience shows that the child acquires the larger part of his skill in various directions by imitation, so that economy and efficiency require that it be the chief resource for learning in school. Socially, it is contended that the chief distinguishing feature of social life is identity of mental contents, especially of thought and beliefs, on the part of the various individuals who constitute society, and that this identity is secured by imitation. Largely under the influence of Tarde, older biological theories of society were replaced by "psychological" conceptions of society, and imitation was made the chief, if not the sole, category of social psychology. If this doctrine be accepted, appeal to imitation is not merely a valuable psychological expedient, but is an ethical necessity.

Both of these conceptions are questionable. A common fallacy seems to underlie them both. Wherever there is a social group, people are found doing the same sort of things; and, what is even more important, believing the same sort of things and using the same standards of valuation. Since it is demonstrable that this similarity is acquired, and since it is certain that the younger members of society have learned from the older, it is an easy conclusion that the likeness is due to imitation. But this explanation hardly does more than to take a result and then give it the name of a cause or force. The certain fact that persons do, externally viewed, imitate one another, that is, do alike and think alike, and that this community is essential to society is translated over into a belief that imitation is a natural internal force, working to bring about the likeness. Closer inquiry shows, however, that other causes are chiefly responsible, and that so far as there is a distinctive psychological tendency to imitate, it works effectively only in subordination to these other factors.

Upon the personal side, the initial factor is the tendency of native impulses and acquired habits to complete or realize themselves in some external form. The child spontaneously, naturally or instinctively as we say, tries to effect something, urged on by the force of his own impulsive tendency. He reaches out his hand, makes babbling noises, tries to throw a ball, to walk, etc. Intent upon his end, he unconsciously selects and adapts anything he notes that might help him. He does what he sees others do in the same situation, not in order to imitate them, — a matter of which he may be quite unconscious, — but as a way of executing his own inchoate tendency. The mere imitation of others, apart from selective use, is found in imbeciles, in the less intelligent children, and in the more mechanical and empty moments of intelligent children. When reliance upon imitation is urged in teaching, the essential thing in the natural situation, personal initiative in a certain direction, is forgotten, and there is substituted for it a servile dependence upon the ends of others. Since the process of selecting and adapting the observed actions of others to one's own results involves intelligence, while taking the acts of others as one's ends abrogates judgment, it is not surprising that objection is made out of school to the latter process.

Further examination shows that imitation, even in its subordinate rôle, is properly called such from without, not from within. Psychologically what occurs is a case of the wider principle of sensori-motor adaptation. While the human infant is not limited to predetermined coördinations of sensory stimulus and motor response, as are the young of lower animals, the necessities of life require that there be some preference for certain forms of behavior in connection with certain modes of excitation. A stimulus of light, for example, at once induces movement of the eyes in fixing and following it. This act operates in turn as stimulus to the body to throw itself into a certain posture, to the arm and hand to reach, and, at times, to follow by tracing the movements of the light. Persons watching a runner, a baseball batter, or one performing a gymnastic feat unintentionally sway the body sympathetically. Externally viewed, there is acceptance of another as a model for copy; psychologically viewed, there is the only completion of the sensori-motor coördination involved in every act of perception. Accordingly, from the side of individual development, "imitation" is but a species of a wider genus. Persons act much alike and think much alike because they are subject to the same stimuli and are urged on by the same needs.

The case works out in a similar way from the social side. Mere imitation would never even make a beginning of a society, because it would only give a number of persons doing the same thing at the same time. A society involves diversity of activities on the part of different persons (division of labor, in a wide sense of that term) and coöperation of different acts to a common end. But in addition to this co-adaptation of different acts to a single result (which is found in machinery), there must be also an intellectual and emotional appreciation of the common end and of the relation of the diverse individuals to it. This fact has been partially recognized in Baldwin's version of Tarde's theory, for he criticizes Tarde on the ground that his doctrine would apply equally well to a collection of tuning forks where one vibrates in response to another. Consequently he amends the conception to read imitation of *thoughts*, or *mental contents*, not of acts. In effect, this is to surrender the idea of imitation and keep merely the name, for thoughts or mental contents as such, cannot possibly be imitated, being invisible and unobservable. And the details of Baldwin's account show that what he really is dealing with is the various processes by which one person *arrives* at community of beliefs and ideas with others. This confirms our statement that the so-called " imitation " is simply a name for the fact that different persons do, in the same community, think alike, that likeness of thought being necessary to social life, but that it is not a causal factor by which this community of ideas and emotions is brought about.

Educationally, the emphasis upon imitation as the essential fact about society not only fails to throw light upon the causal forces by which social direction is brought about, but in a progressive society sets up a false ethical ideal. It makes identity of belief a good, and the supreme social good, just by itself. Such a standard obtains only in static communities, controlled by conformity to custom, and it is a symptom and a cause of their stationary nature. The intellectual and moral progress of the human race has come through first tolerating and then encouraging divergencies and diversities of thought, — the essence of individuality, — and through the conception that mere identity of thoughts is not an end in itself, but an incident of the accomplishment of other ends. More specifically, it is quite contrary to the spirit of a democratic and progressive society to set up as a conscious end the idea that one, even if he be only an immature child, shall repeat the acts of another so as to arrive at a state of passive acquiescence in the ideas of others. Whether as a psychological method or as a social standard, imitation occupies a subordinate position. J. D.

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IMMIGRATION AND EDUCATION. — Immigration creates duties for the administration of schools by introducing into the body of citizens elements which are alien in speech, and are generally of lower intellectual attainments than the mass of the community. Broadly speaking, the problem of assimilating the immigrant is the problem of overcoming the contrasts between his condition and that of the older resident, of wiping out the inequalities of social condition introduced by his coming among us. So far as these inequalities result from a different upbringing, the problem of assimilation is that of education in its largest sense. But the educative value of environment, of laws and of institutions, of contact with other and unaccustomed modes of life and thought, are not here in question. It is also impossible here to discuss the difficulties which arise from the places of origin of immigrants. The specific subject to be considered is how far the established agencies of education, the schools, may and do contribute to the assimilation of the immigrant.

It is necessary, therefore, to have not only a very clear view of what the problem is, but also how far the schools are able to affect it. Before going into the details of the situation created by immigration, it may be well to remember the necessary limitations upon the activities of the school administration, and to bear in mind that after the age of fourteen years has been passed the influence of the school system upon any class of individuals depends upon their consent. Our subject, therefore, falls naturally into three divisions, the influence of the schools (*a*) upon the adult immigrant, (*b*) upon the child immigrant, and (*c*) upon the second generation; or children of native birth and foreign parentage. In its first phase, the predominant influence of the school concerns language; in its third phase, general education. In the second phase the two influences intermingle in varying proportions.

Statistics of Immigration. — The immigrants arriving in the United States are largely adults. The figures published by the Commissioner-General of Immigration show that of 9,555,673 immigrants in the years 1889 to 1910, 8,398,624 or 87.9 per cent, were over fourteen years of age, How widely this proportion departs from a normal age distribution of the population can be seen from the fact that in 1900 among the native whites only 61.1 per cent were over fourteen years of age.

The figures cited show the predominance of the adults among the immigrants. The following table shows the races which in the fiscal years ending June 30, 1899, to June 30, 1910, have contributed to the immigration to the United States. For convenience of reference the proportion of persons over fourteen years of age and the proportion of males and females have been added: —

IMMIGRANTS FOR YEARS ENDING JUNE 30, 1899 TO 1910

Race or People	Total Number of Immigrants	Per Cent		
		Male	Female	Over 14 Years of Age
African (black)	33,630	62.2	37.8	89.7
Armenian	26,498	76.5	23.5	88.8
Bohemian and Moravian	100,189	57.0	43.0	79.6
Bulgarian, Servian, and Montenegrin	97,391	95.7	4.3	98.2
Chinese	22,590	96.0	4.0	95.5
Croatian and Slovenian	335,543	84.9	15.1	95.7
Cuban	44,211	68.5	31.5	82.4
Dalmatian, Bosnian, and Herzegovinian	31,696	92.3	7.7	97.4
Dutch and Flemish	87,658	65.7	34.3	78.6
East Indian	5,786	98.0	2.0	98.9
English	408,614	61.5	38.5	85.0
Finnish	151,774	66.1	33.9	90.9
French	115,783	58.1	41.9	84.3
German	754,375	59.4	40.6	83.0
Greek	216,962	95.1	4.9	96.2
Hebrew	1,074,442	56.6	43.4	75.1
Irish	439,724	47.9	52.1	94.7
Italian, North	372,668	78.3	21.7	91.1
Italian, South	1,911,933	78.6	21.4	88.4
Japanese	148,729	83.8	16.2	98.3
Korean	7,790	90.8	9.2	93.2
Lithuanian	175,258	70.6	29.4	92.1
Magyar	338,151	72.2	27.8	90.8
Mexican	41,914	66.0	34.0	78.1
Pacific Islander	357	78.4	21.6	94.1
Polish	949,064	69.5	30.5	90.8
Portuguese	72,897	59.5	40.5	76.7
Roumanian	82,704	91.0	9.0	97.7
Russian	83,574	85.0	15.0	92.7
Ruthenian (Russniak)	147,375	74.4	25.6	95.5
Scandinavian	586,306	61.8	38.2	90.5
Scotch	136,842	63.5	36.5	84.6
Slovak	377,527	70.5	29.5	90.7
Spanish	51,051	82.8	17.2	90.9
Spanish American	10,669	69.9	30.1	84.4
Syrian	56,909	67.9	32.1	84.1
Turkish	12,954	96.3	3.7	97.8
Welsh	20,752	65.1	34.9	82.3
West Indian (except Cuban)	11,569	57.8	42.2	86.3
Other peoples	11,735	92.0	8.0	95.5
Not specified	77	76.6	23.4	87.0
Total	9,555,673	69.5	30.5	87.9

In the entire number here given the non-English-speaking races predominate. They constitute an aggregate of 8,549,741, or 89.5 per cent of the total. There is quite a contrast between these figures and those of the census in which we find reflected the influence of the older immigration. The earliest distribution of the foreign born by countries of birth is in the census of 1850. In this census there were enumerated 2,244,602 persons of foreign birth, of whom 756,079, or 33.8 per cent, were from non-English-speaking countries. On the other hand, the provisional figures of the census of 1910 show that of 13,342,500 foreign whites 9,571,700, or 71.7 per cent, are from non-English-speaking countries. In other words, recent immigration is bringing to our shores an increasing number of persons who do not know our language.

Schools for Adult Immigrants. — So far as these persons are adults, and most of them are, the schools can as a rule help them to a knowledge of English only in so far as they show themselves willing to avail themselves of the opportunities which the evening schools afford. Originally established for the benefit of persons who had had no early opportunities for an elementary education, our evening schools no longer serve to any large extent to educate the native population in the three R's. Besides the higher grades and high school work maintained for those who wish to continue an education already begun, they serve principally to teach the English language and a few rudiments to foreigners. No comprehensive investigation has yet been undertaken as to the extent to which this service is being rendered by the evening schools of the country.

NUMBER OF IMMIGRANTS TO THE UNITED STATES 1892–3 TO 1910–1911 OF FOURTEEN YEARS OF AGE AND UPWARD, TOGETHER WITH THOSE UNABLE TO READ AND WRITE

From Reports — Bureau of Immigration

Fiscal Year Ending June 30	Total	Unable to Read and Write	
		Number	Per Cent
1893	[1] 359,153	[2] 61,038	[3] 17.0
1894	[1] 227,062	[2] 39,773	[3] 17.5
1895	[1] 213,449	[2] 42,302	[3] 19.8
1896	[1] 290,526	78,130	[3] 26.9
1897	[1] 197,205	43,008	[3] 21.8
1898	[1] 191,032	43,057	[3] 22.5
1899	267,732	60,446	22.6
1900	393,948	93,576	23.8
1901	425,356	117,587	27.6
1902	574,680	162,188	28.2
1903	754,615	185,667	24.6
1904	702,720	168,188	24.0
1905	911,831	230,882	25.3
1906	964,462	265,068	27.5
1907	1,147,005	337,573	29.4
1908	670,722	171,293	25.5
1909	663,492	191,049	28.8
1910	921,061	253,569	27.5
1911	760,750	182,273	24.0

[1] Fifteen years and over.
[2] Seventeen years and over.
[3] See notes [1] and [2].

A few illustrations drawn from school reports of larger cities will show the importance and extent of this service which is rendered to the foreigner by the evening schools. In New York City in the school year 1909–1910 there were 80,369 pupils enrolled in the elementary evening schools, and of these 33,436 were foreigners learning English. In Newark in the same year there were 9135 pupils enrolled in the evening schools of elementary grade. Of these 3055 were in classes for teaching English to foreigners. The superintendent estimates further that among those in other evening schools a large proportion, certainly over one fourth, were

NUMBER AND PER CENT OF IMMIGRANTS ADMITTED TO THE UNITED STATES WHO WERE FOURTEEN YEARS OF AGE OR OVER AND WHO COULD NEITHER READ NOR WRITE, DURING THE FISCAL YEARS 1899 TO 1910, BY RACE OR PEOPLE

Compiled from Reports of the Commissioner-General of Immigration

Race or People	Number 14 Years of Age or Over Admitted	Unable to Read or Write	
		Number	Per Cent
African (black)	30,177	5,733	19.0
Armenian	23,523	5,624	23.9
Bohemian and Moravian	79,721	1,322	1.7
Bulgarian, Servian, and Montenegrin	95,596	39,903	41.7
Chinese	21,584	1,516	7.0
Croatian and Slovenian	320,977	115,785	36.1
Cuban	36,431	2,282	6.3
Dalmatian, Bosnian, and Herzegovinian	30,861	12,653	41.0
Dutch and Flemish	68,907	3,043	4.4
East Indian	5,724	2,703	47.2
English	347,458	3,647	1.0
Finnish	137,916	1,745	1.3
French	97,638	6,145	6.3
German	625,793	32,236	5.2
Greek	208,608	55,089	26.4
Hebrew	806,786	209,507	26.0
Irish	416,640	10,721	2.6
Italian, North	339,301	38,897	11.5
Italian, South	1,690,376	911,566	53.9
Japanese	146,172	35,956	24.6
Korean	7,259	2,763	38.1
Lithuanian	161,441	79,001	48.9
Magyar	[1] 307,082	[2] 35,004	11.4
Mexican	32,721	18,717	57.2
Pacific Islander	336	83	24.7
Polish	861,303	304,675	35.4
Portuguese	55,930	38,122	68.2
Roumanian	80,839	28,266	35.0
Russian	77,479	29,777	38.4
Ruthenian (Russniak)	140,775	75,165	53.4
Scandinavian	530,634	2,221	0.4
Scotch	115,788	767	0.7
Slovak	342,583	82,216	24.0
Spanish	46,418	6,724	14.5
Spanish-American	9,008	547	6.1
Syrian	47,834	25,496	53.3
Turkish	12,670	7,536	59.5
Welsh	17,076	322	1.9
West Indian (except Cuban)	9,983	320	3.2
Other peoples	11,209	5,001	44.6
Not specified	67	5	7.5
Total	8,398,624	2,238,801	26.7

[1] Including 693 " Hungarians " in 1899.
[2] Including 35 " Hungarians " in 1899.

of foreign birth. In Jersey City in an enrollment of 2240 in evening schools 1122 were of foreign birth. In Philadelphia in a total registration of 12,230 in elementary evening schools 6354 were of foreign birth. Chicago in the school year 1907–1908 had 20,133 enrolled in all its evening schools, and among them were 12,344 in the foreign classes and 1267 other persons of foreign birth in other classes. There are also a very few interesting day classes for foreign adults, which are frequented by persons, such as watchmen, who pursue their regular callings at night.

Illiteracy among Immigrants. — The problem of the immigrant is not only one of language, but of general education. Unfortunately we possess no generally accepted standards by which education can be statistically measured, except for such slight minimum of education as is represented by the ability to read and write. In the absence of other measures, this becomes important. It is a familiar fact that the immigrants do not measure up to the standard of literacy which prevails in the nation at large, and especially in the white population. The table on the preceding page summarizes by years the illiteracy of immigrants.

There is in these figures no evidence of improvement during the period, but rather the reverse. This change may be due in part to the shifting of the character of immigration. In this connection the table of illiteracy by races which precedes is of interest.

An examination of this table reveals great diversity. Many of the races here represented show a less degree of illiteracy than was found in 1900 in the native white population of the United States (4.64 per cent). Others show a much larger percentage, which in several cases represents more than half the immigrants. Some of the races represented in the table have been coming to the United States in greater or less number for many years. These are the Dutch, English, Flemish, French, German, Irish, Portuguese, Scandinavian, Scotch, Spanish, and Welsh. The remainder are comparatively newcomers. Designating the former for convenience as the old and the latter as the new immigration, we have the following results as to illiteracy among the two classes in the period 1899 to 1910.

ARRIVALS 1899–1910, FOURTEEN YEARS OF AGE AND UPWARD

	Total	Illiterate	Per Cent Illiterate
Old	2,122,282	103,948	4.9
New	6,276,342	2,134,863	34.0
Total	8,398,624	2,238,811	26.7

It would be a mistake to assume from these figures that immigrants are necessarily more illiterate than formerly. They merely show that if immigration came to-day from the same countries as formerly there would be less illiteracy than at present. In 1850, 42 per cent of the foreign born were Irish. Ten years earlier, in 1841, the Irish census ascertained the fact that 53 per cent of the population were illiterate. Hence we may infer that the illiteracy of the immigrant was as great sixty years ago as it is to-day.

The statistics of illiteracy among immigrants are in part borne out by the census figures for the illiteracy of the foreign born. The census figures are as follows: —

Census	Per Cent Illiterate
1880	12.0
1890	13.1
1900	12.9
1910	12.8

The wide difference between these figures and those of the immigration authorities might be accounted for on the supposition that the older immigration had less illiteracy, and hence the percentage was less among the foreign born, with its many representatives of this class, than among the recent immigrants. As we have seen, this position is hardly tenable. The explanation may be in part that among the birds of passage who come and go there are more illiterates than among those who permanently remain in this country.

It is clear from the consideration which has already been given to the ages of the immigrants that the public school can do little toward reducing this illiteracy. Only a small proportion of the immigrants themselves come perforce under the operations of the school system, since relatively few are under fourteen years of age, the usual limit of compulsory school laws. Night schools can, as we have seen, do something, but their influence is limited. Those who in the struggle to get a foothold yet find time to avail themselves of the opportunities such schools afford, are for the most part those who have a reading knowledge of their own languages. Before considering the question of the relation of the schools to the small class of child immigrants, we may inquire how far the illiteracy of the immigrant and of the foreign born tends to perpetuate itself in the second generation.

Illiteracy among Children of Foreign Parents. — On this point the census enumerations bear gratifying testimony. The native whites of foreign parents have a smaller percentage of illiteracy than the native whites of native parentage. The testimony of the census of 1900 was as follows: —

Native White	Per Cent Illiterate	
	North Atlantic	North Central
Native parents	1.7	2.8
Foreign parents	1.5	1.3

Instead of figures for the United States, those of the divisions where the foreign element is most numerous are given in order that the two groups may be compared under circumstances as nearly as possible identical. In each case the proportion of illiteracy is gratifyingly small, but it may be noted that in each group of states mentioned it is less for the persons of foreign than of native parentage. This apparent advantage in favor of the foreign element is due to the fact that they are more largely city dwellers than the pure native stock, and enjoy on the whole better educational advantages. If the two groups be compared in the same localities, as, for instance, in the cities, there appears a slight advantage in favor of the purely native stock, though, as already noted, the amount of illiteracy for either class is insignificant. In the disappearance of the difference as respects illiteracy between native and foreign elements in the second generation we have indirect evidence of the service of the schools in assisting in the assimilation of the immigration.

Schools and Young Immigrants. — We may now return to the question, what can the schools do for the child immigrant? This manifestly depends upon the age of the child, which determines the length of time which it will stay under the school influence. If the child is under school age at the time of its arrival in the United States, it enters the school with little more handicap than children of the same race who are born in this country. If, on the other hand, the child is twelve years old when it comes here, it is not likely to have more than two years' schooling.

Just how the children arriving in the United States are distributed as to ages is not apparent from the statistics of immigration. An investigation conducted by the Immigration Commission in twelve different cities in the United States showed that of 38,254 children having foreign fathers there were 8724, or 22.8 per cent, born abroad. Of the latter information was available as to the age of arrival in the United States, as follows: —

Age	Number	Per Cent
Under six years	4785	57.1
Six and seven years	1647	19.7
Eight and nine years	1108	13.2
Ten years and over	838	10.0
	8378	100.0

It appears that more than half the children had not yet reached the age of school attendance.

For the older child the problem of the public school is largely one of language rather than of general education. How can these children be taught to understand what is going on around them in the school? Where they are few in number the common expedient is to put them into the first grade and hope that they will gradually be able to take part in the school work.. This is largely leaving them to work out their own salvation, but it places them in favorable position to do so. It introduces them to the English language in its simplest forms, as the vocabulary of the teacher in first-grade instruction is of necessity limited to simple words and is combined into simple sentences. Better results are obtained when it is possible by reason of their number to place these pupils in a special class under a teacher skilled in teaching them English and awaiting a certain proficiency in English, before assigning them to the regular grades. Such classes are a regular feature of many school systems of our cities with a large immigrant population. The obstacle to the generalization of this system is that there are not enough children of this description in each of the schools to constitute special classes. This is in practice largely overcome by the habit of the immigrants of settling in definite localities in the cities where they find others of their race.

Special Classes. — In New York City, where the special classes for foreigners are highly developed, the foreign-born child of eight years of age or under is usually placed in the regular grades, the special classes being considered necessary only for older pupils. With upwards of 600,000 pupils in the elementary schools of New York City in 1900, there were 1240 in these special classes. Cincinnati gives to the newly arrived children who are nine years of age or over training especially in English. One class suffices for the city. It is obvious that the needs of the older immigrant child, however important to the individual himself, do not present a problem of such magnitude that it taxes in any way the resources of the school system.

For the younger immigrant child, who was brought here by his parents as an infant, and who enters school at the same age as other children, the problem of language is of no special significance. It is not infrequently supposed that the language problem is the most serious one in the education of the child of foreign parents. The experience of the schools, so far as the younger children are concerned, refutes this view. The foreign child who enters the first grade, or better still the kindergarten, has no unusual difficulty. The language of the schoolroom is so simple that its comprehension is readily acquired and the child advances at an equal pace in his knowledge of English and his studies. It is understood that in the Philippine Islands no difficulty is encountered in teaching in the English language, and the writer had a like experience in conducting the schools of Porto Rico. In these instances English is used as a medium of instruction when there is far less English as a background in the environment of the child than in our American cities. It is not contended that for these very young children an ignorance of English is not a factor of some importance. But its importance consists not in a direct impediment to the progress of the child, but in its significance as an indication of a home environment unfavorable to the school progress of the children.

Native Children of Foreign Parents. — Our discussion of the relation of the schools to the immigrant children has brought us by natural stages to the consideration of a group among them, in which the fact of foreign birth has little significance except as it involves foreign parentage. There is in fact little difference ten years later between the child who was brought into this country as an infant in arms and his one or two years younger brother or sister who was born in this country. We may therefore now inquire as to the relation of the schools to children of foreign parentage.

The native children of foreign parentage in our schools represent the offspring of many races, which may or may not vary from the native white American in language, but are supposed to vary to at least some extent in traditions, ideals, and aspirations. Such differences appear, so far as the record goes, to have had little effect in perpetuating among the second generation that great degree of ignorance which we term illiteracy. It may, however, be that if we could establish some higher standard of proficiency it would be seen that there was some divergence between the progress of children of native as compared with foreign parentage. Considerable light can be had on the problems of school advancement by a study of the facts of grades and ages of the pupils, and especially of the relation of the two expressed in the now familiar concept of retardation (*q.v.*). The investigations of the Immigration Commission in 1908 conducted by the writer, the results of which have been only partially published, cover a wide range, embracing a study of pupils in thirty-seven different cities. These investigations distinguish pupils by parentage determined by the race of the father. The contrast which here concerns us is between white children having fathers born in this country, and those whose fathers were born abroad. In the latter group are included native whites of foreign parentage, the predominant element, and foreign white; but as we have already seen, the last-named are comparatively few in number. It would exceed the limits of space to give anything more than a few brief notes of the main results of this investigation.

PUPILS IN SCHOOL AT EACH AGE FOR 1000 AT AGE OF NINE YEARS

Children of	5 Years	6 Years	7 Years
Native fathers . .	84	733	943
Foreign fathers . .	89	772	934

The figures for the ages are used to establish certain probabilities in regard to entering and leaving school. Pupils in school in the early ages are compared with the estimated number at nine years of age computed by taking the average of those reporting the three ages eight, nine, and ten years. The results in proportions are given on previous page.

In like manner we can compare the older children in school with the computed number at the age of eleven.

PUPILS IN SCHOOL AT EACH AGE FOR 1000 AT AGE OF ELEVEN YEARS

Children of	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years
Native fathers .	963	769	503	297	173	136
Foreign fathers .	959	665	333	145	71	57

These parallel figures show clearly that there is very little difference between the children of native fathers and those of foreign fathers with respect to their early entrance in the schools. There is, however, a smaller representation of the children beyond the school age among those whose parents are foreign than among those whose parents are native. Such a smaller representation might be due in the case of individual races to the fact that in these ages there were fewer children in the community. But with respect to the children of foreign parentage as a whole, such an explanation is not valid, and the more obvious one that children of this class drop out of schools sooner than those whose parents are native applies.

Confirmation of the conclusion that the children of foreign parentage leave school at an earlier age than those of native is found in the following figures, which distribute the children among the different schools.

PER CENT OF ALL PUPILS IN DIFFERENT KINDS OF SCHOOLS

Children of	Kindergarten	Primary	Grammar	High School
Native fathers .	4.3	52.1	34.5	9.1
Foreign fathers .	4.4	57.6	33.3	4.7

It will be noted that in the grammar and high schools where the children are of older age the proportions are less for the children of foreign parents than those of native parents.

With respect to the progress of children within the schools, we have a convenient measure in the concept of retardation. This is calculated in the following ratios for all elementary pupils and also for those pupils who are ten, eleven, and twelve years of age.

PER CENT OF PUPILS WHO ARE RETARDED

Children of	All Elementary	Pupils, 10, 11, and 12 Years of Age
Native fathers . .	34.1	42.0
Foreign fathers . .	36.0	46.2

By both methods of calculation it appears that the retardation of the children of foreign parents is somewhat greater than those of native parents, but the most remarkable result of these investigations is not that the difference is so great, but that the difference is so small. In other words, this investigation confirms in general terms the showing of the census that so far as intellectual attainments are concerned any difference between the native and the foreign stock practically disappears in the second generation.

It is to be noted that in the foregoing percentages in the investigation of the Immigration Commission we are dealing with the pupils of foreign stock, and not merely with those of foreign parentage. Had the investigation eliminated the children of foreign stock who were born abroad, it is more than likely that even the small differences which have been observed would disappear in the contrast between the children born in the United States of foreign parents compared with those born of native parents. In a more limited investigation undertaken by the commission, where it was possible to make this distinction, there were a number of cities in which the retardation of the children born in the United States of foreign parents was even less than that of purely native children.

This special investigation brought out clearly the fact that the language inherited by children of foreign birth was not in itself a serious obstacle to the progress of children in American schools. The backwardness of the foreign child and the child of foreign descent, so far as it is established by this investigation, appears as a result of various conditions of home life which are unfavorable to the best progress of the children in the school. However great the duties which immigration creates for the administration of schools in the United States, the records show that the schools have in large degree mastered those duties and have contributed in no small measure to the gradual process of assimilation by which the foreign elements are merged into the body of the American people.

R. P. F.

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IMMUNITIES. — See Exemptions; School Management.

IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY. — See London, University of.

IMPRESSION. — A general word referring to sensory mental processes. Thus one receives a visual impression from a bright object, an auditory impression from a source of sound. Practically synonymous with the word "sensation." In ordinary parlance, the word is used with a somewhat more general sense to refer to striking experiences as well as simple sensory processes. C. H. J.

See Sensation.

IMPRESSION. — In Method. — The traditional methods of teaching in the lower schools have been for the large part dogmatic and authoritative. They called for a receptive attitude on the part of the child, rather than one which is active. There is, however, a vigorous reaction expressing itself against such modes of procedure. Its effects are noted in the effort to introduce subjects which call for increased motor and mental activity upon the part of the child; thus manual training, singing, drawing, and play have grown in favor. A similar effect is found in the domain of teaching method. Teaching the children to study rather than merely to memorize is a movement toward the development of a larger initiative in the pupil. Dramatization and "action work" as modes of instruction are other influences suggesting increased emphasis by the modern teacher on the self-activity of the child. The popular pedagogical phrase, "No impression without expression," summarizes the modern psychological attitude toward instruction. H. S.

See Teaching, Principles of; Motor Activity.

IMPULSE. — Activity which is not preceded by deliberation, which follows immediately upon an external impression and is consequently likely to be relatively unintellgent, is described as impulsive. The term "impulse" is used not only for the above described type of activity, but it is used as a general term to indicate any tendency on the part of individuals toward definite lines of action. That is, there is a general impulse toward imitation (*q.v.*), an impulse toward self-preservation. (See Instinct.) Impulsive activity is characteristic of undeveloped individuals. The savage is impulsive in his activities rather than deliberate. The child is impulsive.

C. H. J.

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IMPURITIES IN THE AIR OF SCHOOLROOMS. — See Air of the Schoolroom; Cleanliness of the Schoolroom; Heating and Ventilation.

INATTENTION. — See Attention.

INCENTIVES. — See Rewards and Punishments; also Attention; Interest; Motives; School Management.

INCEPTION. — (Latin *incipere*, to begin, commence.) The ceremony of admission to the rank or grade of master or doctor in the medieval universities. With it was connected the entrance on the teaching career by actual performance of duties pertaining to it. Two influences may be traced in the ceremony of inception: (1) Of Roman law, "according to which a man was invested with the *de facto* possession of his office by an actual and solemn performance of its functions" (Rashdall), and (2) the guild initiation of a master by older members, and possibly the ceremony of investiture of a knight. The ceremony at Paris University was performed in the schools of the respective faculties, and consisted of the placing of the cap or *biretta* on the candidate's head and the granting of the ring and the book by his former master, who also conferred on him a kiss and a benediction. The inceptor was then placed in the master's chair and delivered a lecture or held a disputation. The expenses of the ceremony were considerably increased by the custom of making presents to the older master, of contributing to the society's funds, and of giving a banquet to the new colleagues. Inception became in time more important than the Chancellor's license to teach, and corresponded in every way to the compulsion to belong to a guild before a trade or craft could be practiced.

The inception or *principium* was common in Paris and the northern universities; at Bologna the corresponding ceremony or public examination was known as the *conventus*, which was conducted in the cathedral and was more elaborate and expensive than at Paris. Compare the use of the term commencement (*q.v.*) for the graduation ceremonies in American universities.

See Degrees; Universities.

INCIDENTAL EDUCATION. — It is held by some that a certain mental capacity can be trained without explicit attention to this particular faculty. Thus, if we carry on a course in history, there may be an incidental training of the moral sense. The possibilities of leaving certain phases of education to be taken care of in a secondary way in connection with major forms of training has been much discussed. It would be economical, if we could relegate the training in reading to the science class, devoting the major attention in this class to the subject matter, and yet securing incidentally for the children the ability to use language. A distinction of importance should undoubtedly be made in these discussions. A certain type of training may be incidental from the point of view of the child, but explicit and primary from the point of view of the teacher. On the other hand, a certain type of training may be incidental both for the teacher and for the child. In this latter case the training which is treated as incidental is likely to be neglected altogether. In the former case, while the child regards himself as working for a given end, he may be induced through skillful guidance to carry on a variety of activities which will conduce to training in a number of different directions. The secondary lines of training are incidental in this case only for the child, not for the teacher. C. H. J.

See FORMAL EDUCATION; FAMILY EDUCATION.

INCIDENTAL METHOD. — Any plan calling for the teaching of a series of facts, forms, or skills incident to the systematic study of some other subject utilizes the "incidental" method of teaching. Arithmetic, spelling, and grammar are among the subjects that are sometimes taught incidentally. Thus if arithmetic is not taught systematically as a subject till the third school year, it is taught incidentally during the first two years, that is, such arithmetical facts are taught as occur in the normal experience of the child or within the other school subjects. Again, those who propose that the subject of grammar should not be taught as a separate subject suggest that its important and useful facts might be taught as mere incidents of written composition. A still further instance is found where it is urged that spelling should be discontinued as a subject with the close of the sixth school year and taught incidentally thereafter.

H. S.

See .METHODS, TEACHING.

INCIDENTAL PERIOD. — In arranging the school program it is the practice in some schools to leave certain class periods unassigned to a specific activity, such as a recitation in arithmetic or a study period in history. These hours are termed " free " or " unassigned " periods, and are utilized by the teacher only as special need occurs, such as the need to bring up a class in language, or to render additional assistance to individuals who are behind in their work. Because of the use of such time for incidental needs that arise in the course of the regular teaching, they are termed " incidental periods." H. S.

INCOHERENCE. — See SPEECH DEFECTS.

INCOMMENSURABLE QUANTITIES. — Quantities that have no common measure with a quantity arbitrarily taken as the unit. For example, if the side of a square is taken as unity, the diagonal of the square is incommensurable with it, and numerically it is represented by $\sqrt{2}$. The number $\sqrt{2}$ is called an incommensurable number, there being no integer or common fraction that will exactly divide it and unity. Incommensurable numbers have of late been the subject of extended study, notably by Dedekind and G. Cantor.

From the standpoint of the secondary school, the interest in incommensurable numbers and magnitudes centers in the work in radicals in algebra and in the so-called " incommensurable cases " in geometry. The scientific study of incommensurable numbers is so recent that no attempt has been made to introduce the modern theory into elementary algebra. On the other hand, the study of incommensurable lines, surfaces, and volumes found place in Euclid's *Elements*, and hence it still appears in many textbooks in plane and solid geometry. A popular treatment of the subject from the numerical standpoint would be quite as easy as one that relates to geometry. It is, however, the growing opinion that the concept is too abstract for the immature mind of the high-school pupil. The treatment of the subject in the current geometries is not scientific, and, since it is merely a popular introduction to the theory and is understood by a relatively small number of pupils, it is, at the present time, passing out of the high-school curriculum in the United States. It is felt that its place is in the calculus, where the theory of limits is treated with some approach to scientific rigor. It is entirely proper, in the secondary school, to speak of the incommensurable, both in algebra and geometry, explaining its general nature. Any serious attempt at a scientific treatment of the subject is, however, out of place at this point in the pupil's education,

D. E. S.

INCORRIGIBLE CHILD. — See EXCEPTIONAL CHILDREN; SPECIAL CLASSES; TRUANT SCHOOLS.

INCUBATION PERIOD OF DISEASES. — See CONTAGIOUS DISEASES.

INDEPENDENT WORK. — See SCHOOL MANAGEMENT.

INDETERMINATE EQUATIONS. — An equation is said to be indeterminate when there are indefinitely many roots that satisfy it. For example, $x + y = 4$ is satisfied by the following pairs of roots: (0, 4), (1, 3), (2, 2), (3, 1), (4, 0), (5,–1), and so on indefinitely, and by an infinite number of non-integral roots, such as $(3\frac{1}{2}, \frac{1}{2})$, $(7\frac{3}{4}, -3\frac{3}{4})$, and $(\sqrt{2}, 4-\sqrt{2})$. A system of equations is indeterminate when there are indefinitely many roots that satisfy each and every one of the equations. In general, if there are n equations and $n + 1$ unknown quantities, the system is indeterminate. The subject of indeterminate equations, particularly of the second degree, was first studied extensively by Diophantus (*q.v.*), and hence such equations are often called Diophantine equations. An indeterminate equation may have only a limited number of positive integral roots, as in the case of $x + y = 4$, or it may have an unlimited number of such roots, as in the case of $x - y = 4$. In the older textbooks on algebra the former of these two kinds of equation often appeared, with the direction that the equation was to be solved in positive integers. At present, so crowded has the course in elementary algebra become, the subject plays practically no part in the work preparatory to the American college, although it is found occasionally in the college course. Since it does not lead to any other theory of much importance, it is generally felt that the time which an extended study of the subject would require may better be devoted to other work. The subject of alligation (*q.v.*) is an early phase of this one, representing a crude form of indeterminate analysis applied originally to questions of the mixing of metal in coinage.

Aside from the general subject of indeterminate equations, there is the special question as to when an equation or a system of equations is determinate, and this properly forms a significant topic in elementary algebra. In this connection the graphic representation of an equation is helpful.

As an example of an indeterminate equation of the second degree, suppose two positive integers are to be found such that if their product is taken from the sum of their squares the difference shall be a square. In other words, required to solve the equation

$$x^2 + y^2 - xy = \text{a square, say } z^2,$$

in positive integers. The equation is satisfied if $x = 2mn - n^2$, $y = m^2 - n^2$, $z = m^2 - mn + n^2$, and special solutions may be obtained by substituting any positive integers for m and n, with the limitation that m shall be greater than n. D. E. S.

INDETERMINATE FORMS. — Certain quantities met in algebra are in forms such that it is frequently impossible to determine their value. For example, $\frac{0}{0}$, $\frac{\infty}{\infty}$, ∞^0 are such forms. In the secondary school such expressions are properly avoided, being relegated to the calculus where they have place. When met in elementary algebra, as in the case of $(a - b) \div (a - b)$ when $a = b$, they are best passed over without reference to the fundamental principle of limits that is involved. It is sufficient, when the symbol $\frac{0}{0}$ arises in the interpretation of a problem in elementary algebra, to say that $a \cdot 0 = 0$, where a is any finite number; whence, if we think of 0 as being admitted as a possible divisor, we have $a = \frac{0}{0}$. It is therefore reasonable to define the form $\frac{0}{0}$ as standing for indetermination. While not satisfactory as a scientific proof, this simple explanation of the reasonableness of the definition is sufficient for elementary algebra.

D. E. S.

INDEX OF PROHIBITED BOOKS. — See LITERARY CENSORSHIP.

INDEXES. — See BIBLIOGRAPHIES OF EDUCATION.

INDIA, EDUCATION IN. — **Political Organization of the Empire.** —Strictly speaking, the term British India applies only to the divisions under direct British administration, and does not include the native states which are indirectly under British rule. The native states have independent control of their educational affairs, but they are rapidly adopting the system developed for British India. For purposes of administration, India is divided into nine great provinces, namely, Madras, Bombay, Bengal, Eastern Bengal, and Assam, united provinces of Agra and Oudh, Punjab, Central Provinces, Northwest Frontier Provinces, and Burma. There are also the following minor charges: Coorg, Ajmer-Merwara, British Baluchistan, and the Andaman Islands. Each of the nine provinces is under the administration of a governor, or a lieutenant-governor. The governors of Madras and Bombay are appointed by the Crown; the remaining chief officers are appointed by the Governor-General with the approval of the Crown. The minor charges are each under a chief commissioner.

Each province is usually broken up into divisions under commissioners, and these, again, are divided into districts — numbering in all about 259 — which are the units of local administration. The supreme executive authority in India is vested in the Governor-General in Council, often styled the Governor of India. He is appointed by the crown, and usually holds office for five years. The control of the Governor-General extends to all the provinces, but they enjoy a large degree of administrative independence varying with their importance. The local government of British India is vested in municipal boards, the members of which are, in large majority, elected by the ratepayers (Acts of 1882–1884). For rural tracts, there are district and local boards which are in charge of roads, district schools, and hospitals.

The area of the British provinces is 1,097,901 square miles; the population (census 1901), 232,072,832; the average population per square mile, 211. The area of the native states is 690,272 square miles; the population (census 1901), 61,325,376; population per square mile, 189. The totals for India are, then: area, 1,766,642 square miles; population, 294,361,056; population per square mile (census 1901), 167. The total as given in census of 1911 is 320,132,537.

Ancient Systems of Education. — *The Hindu System.* — The endeavor of the British government to engraft a system of modern education upon its Indian Empire is impressive by reason of the enormous population dealt with, and the character of the native civilization and culture. From time immemorial India has been a land of schools, of literature, and of philosophy, inseparably associated with the religions which dominated its people before the advent of the English, and have profoundly affected the course and progress of education under their auspices. The first of these, the Hindu religion, gave to the land the Vedic literature, the Brahmans or priestly class, and the caste system; in other words, all that has proved vital and permanent in Hindu higher education.

The Vedas reveal the religious ideas and the movement of this Aryan people from the time they began their invasions of India, swept onward from the Indus to the Ganges, overcame or scattered the indigenous tribes, and eventually organized kingdoms each under its own ruler, but all dominated by the powerful priesthood.

In the absence of chronological records, all dates in the early history of India are inferences chiefly from the Hindu language and literature; but it is generally agreed that the Brahmanic period began about 500 B.C. and continued with little abatement of power to the thirteenth century of our era. The Brahmans were the priests, teachers, and lawgivers of the people, the custodians of the Vedic hymns and authors of the whole body of literature based upon them — the mythologies, rituals, commentaries, and laws — for all of which they claimed divine sanction. This sacred literature, together with heroic, secular poems and a crude science, also of Brahmanic origin, were the substance of Hindu higher education. The Brahmans determined the limits of knowledge for the castes below themselves, the *Kshatriyas* (warriors), the *Vaisyas* (husbandmen), and the *Sudras* (artisans and traders). Below the *Sudras* was an undefined mass of people, the indigenous tribes, low-down Aryans, and mixed peoples, indiscriminately termed *Pariahs* (outcasts). For these there were no rights nor privileges, and no instruction excepting what filtered down through the all-pervading religious ceremonials — incantations, sacrifices, and idol worship — still maintained in parts of India.

On account of the difficulties of Sanskrit, the language of the Vedic literature, the Brahmans had a practical monopoly of learning; the majority merely learned by rote the hymns and prayers and ritual used in the religious ceremonies, leaving to the few that lifelong absorption in learning which was one condition of attaining supreme bliss.

The sacred obligation to teach, laid upon every one of the higher caste, was accomplished in general by oral instruction, which imparted to the privileged the religious ideas and caste obligations that made up the chief concern of life. As the social organization developed, there gradually grew up separate schools of literature, of law, of Vedanta, and even separate schools of astrology or astronomy and of medicine.

While the Brahmanic or Sanskrit schools of learning reached but a small fringe of the immense population, the village school had a much wider range. It was an integral part of the village life, which, like the caste system, illustrates the organizing genius of the Brahmans. The soil, chief source of wealth in that agricultural land, was controlled by the community, though not to the exclusion of private ownership. The civil offices — headman, accountant, priest, schoolmaster, etc. — were hereditary in families, and carried for the incumbent an allotment from the village land. The various industrial arts, carpentry, pottery, weaving in cotton and silk, leather work, stone cutting, and the higher arts fostered by royal luxury and by the religious ceremonials, — architecture, sculpture, and the goldsmith's art, — were also hereditary. The craftsman, like the civil officers, had his allotment of the village lands, and he was, moreover, a member of a guild which had rights and obligations of its own. Thus industrial art was a product of family training.

The village school (*pathsala*), like the village itself, was founded on the sanction of the *Shastras* (books of sacred laws). In its primitive form it was a mere class of village boys from five years of age to ten or twelve years, sons of petty landowners, traders, and cultivators, assembled around the master, under a spreading tree or in a shed. The instruction was oral, and as each boy had his own task, the older pupils taught the younger. Tracing the letters on a sandboard with the fingers, and afterwards on the ground with a crayon, constituted the earliest exercises; later, words and sentences were written on palm leaf or on prepared wooden tablets, with a reed pen dipped in charcoal ink; the numeration tables, money, weights, measures, and simple accounts completed the course of instruction. In some parts of India, especially in the Punjab, there were attempts at regular gradation of classes, and in the trading centers, there was a class of schools termed *Landé*, in which boys learned to write a special business character. The village schools, in which only the vernacular language was used, were entirely distinct from the Sanskrit colleges (*tols*). The former had an eminently practical aim; whatever formative influence they exercised was due to the personal character of the teacher, to the ethical maxims which were copied and recited, and to the stories and verses rehearsed to the pupils.

The Brahmanic system of caste and caste education in its full development was limited to the " middle land " of India; that is, to the region north of the Vindhya range comprising the river systems of upper India with their fertile valleys; but the village system and the religion of Brahma spread throughout India.

Antagonistic Influences. — Every religious movement that subsequently developed in India was a reaction against Brahmanic domination, the tyranny of caste, and the monopoly of learning. Chief among these reactions was Buddhism, which prevailed over Northern India from the sixth century B.C. to the eighth century A.D., when it was driven out of the Indian peninsula by the persecutions of the Brahmans. Buddhism left no schools in the land, but it struck at the heart of Brahmanism by its doctrines and its recognition of secular teachers. (See BUDDHA AND BUDDHISM.) A similar influence was exerted by the Sikhs, the Protestants of the Punjab, who arose in the fifteenth century, and whose schools remain to the present time.

Mohammedanism. — The Mohammedan religion was introduced into India by an alien people in the eleventh century, and its power and permanence were assured by the establishment of the Mogul empire in the sixteenth century. The first revelation to Mohammed is contained in a single verse of the Koran: " Read in the name of thy Lord! " In obedience to this command, every mosque in India, like the cathedrals of Europe, had a school attached, in which children were taught the Arabic alphabet and selected verses of the Koran. In the higher schools, which were supported by imperial grants and private bounty, learned Mohammedans taught Arabic, the sacred language of the Koran, and Persian, the language of the royal circle and of the courts of law, where Moslem rule was established. To the study of language were added rhetoric, logic, literature, law, and crude science. All students were welcome, and the Persian schools became a common meeting ground for Hindu and Moslem youths; even women were not ignored in the scheme of universal instruction.

The Moslem teachings operated as an organizing influence among the outcasts and the aboriginal tribes; and at the same time they modified the rigid caste notions of the Brahmans themselves. As a consequence, many treasures of Vedic literature were translated into the vernaculars.

At the advent of British rule in the seventeenth century the population of India was comprised substantially in the two great bodies, Hindus and Mohammedans, in about the proportion of four to one. In this comparison aborigines, who in 1872 numbered five and a half million in a total of 191,096,603, are not included. Unlike as were the principles of the two systems, the effects of their intellectual disciplines were similar. Both gave excessive development to the memory and fostered a passion for abstract reasoning, qualities which must be kept in mind in the endeavor to estimate the progress of Western education in the empire. Schools of both systems, in number about 40,000, are still in operation, as shown by the government reports. Many of the old village schools have been transformed into modern primary schools, and a few Sanskrit and Persian higher schools partially transformed into modern colleges.

As to the existence, general character, and wide diffusion of the ancient schools, all authorities agree; but no statistical measure of their operations was attempted before the English occupancy. Investigations carried on in three presidencies, Madras, Bombay, and Bengal, between 1823 and 1835, showed about the same condition in all. The most complete of these investigations was made in Bengal by Mr. W. Adams, who reports 3355 schools with 41,247 pupils in a population of 7,789,189. Mr. Adams estimated that of the adult male population about 5.55 per cent could read and write.

The Transition Period. — The British East India Company was incorporated by the British Government in 1600, under the title of the Governor and Company of Merchants of London trading in the East Indies, and soon after received the charge of Bengal from the Emperor of Delhi. During the first century of the Company's operations nothing was done in regard to education in their ever-increasing domain. The work was begun by missionaries, who followed the traders early in the eighteenth century, and for a hundred years more the record of English educational effort in India is solely that of missionary zeal reënforced at a few points by private undertakings. No action was taken by the government in the matter until 1813, when, upon the renewal of the East India Company's charter, a clause was introduced providing for an annual expenditure of 100,000 rupees (equivalent at that time to $50,000), by the Company's Court of Directors, for education in India. The appropriation was expended largely in scholarships to enable promising students to attend the existing schools, and for some time the government merely supplemented missionary and private agencies with a constantly increasing effort at their organization. The entire period, from the beginning of the eighteenth century until the middle of the nineteenth, when the Indian government was charged with full responsibility for the education of the native population, may be regarded as a period of transition from ancient to modern conditions. It prepared the way for a general system of native education on European lines and under government direction. Two essential conditions of the system were worked out in missionary schools: the use of the vernaculars in the instruction of the masses; and the place of English in the scheme of higher education. The former was accomplished by the work of Carey, Ward, and Marshman in the Baptist mission at Serampore. These men, all oriental scholars of note, devoted themselves to the double task of teaching the humbler natives and translating modern textbooks into the languages familiar to Hindu and Mohammedan scholars. The question of English was practically settled by the action of Dr. Alexander Duff, who arrived at Calcutta in 1830 as the representative of the General Assembly of the Scotch Church. Ignoring all precedents, this energetic leader at once opened a school in Calcutta with the express purpose of making English the medium of instruction in the science and literature of Europe. The success of the school and Dr. Duff's articles on the subject, in the home papers, played a prominent part in the famous controversy of 1834.

While the mission schools were thus pushing forward on new lines, the private institutions established during this period — the Mohammedan College founded by Warren Hastings in Calcutta in 1780 and a Sanskrit College established in 1791 at Benares by a wealthy English resident — followed oriental models, and thus prevented a sudden and disastrous break between old interests and new purposes.

In 1823 the Indian government created a committee of public instruction to take charge of the annual appropriation for the work and of the institutions which had come under government control. These included one English and six oriental colleges, together with a number of elementary schools in Bengal. The committee became the organ of the government for education, and local committees were appointed to supervise the institutions that had the benefit of the fund, and to report to the central committee. In 1833 the annual appropriation was increased from 100,000 to 1,000,000 rupees ($50,000 to $500,000), after a hot debate over the question of the language to be adopted as the medium of higher education fostered by the government in India.

The opportune arrival of Lord Macaulay in India as the Legislative Member on the council of the Governor-General settled the controversy in favor of the English language. Macaulay's Minute on the subject, bearing date Feb. 2, 1835, was followed by a proclamation issued by the Governor-General, Lord Bentinck, on the 7th of March of the same year, which declared that " the chief aim of the educational policy of Government should be to promote a knowledge of European literature and science." The use of the government grants in printing oriental books was discontinued, and the funds thus set free were thenceforth applied to promoting European studies through the medium of the English.

As a consequence of this decision English schools were opened in all the provinces. Hoogly College (Bengal), established in 1836, enrolled 1200 students, and an annex was at once provided. Statistics for 1843 gave a total of fifty-one schools and colleges under the government, comprising 8200 scholars. Of these 5132 were studying English. Moreover, Christian, Mohammedan, and Hindu boys, without regard to caste, came together, prompted by the common desire to learn the English language. The motive was obvious; the experience of centuries had taught the natives the advantage of knowing the language of their rulers; in the case of English, expectation was stimulated by the declared purposes of the government to admit trained natives to posts of importance. The principles laid down in Macaulay's Minute have never since been surrendered; but the claims of the classic learning of India were recognized in 1839 by a minute restoring for its maintenance an annual grant of 25,000 rupees.

During this period advance was made in all the provinces. In Bengal higher education received chief attention; in the Bombay Presidency the foundations of a public system of education were firmly laid by the vigorous action of Governor Elphinstone; in Madras native and missionary influences prevailed; in the Northwestern Provinces a model system of vernacular schools was developed through the endeavors of Mr. Thomason, the Lieutenant-Governor; in the Punjab, which did not come under the authority of the Company till 1849, a marked impetus was given to the indigenous schools and colleges.

Before the close of the period all the agencies of education, still at work in British India, missionary and private, municipal, provincial, and governmental, were fully established.

The Government System. — *Departmental Period.* — In 1853, when the renewal of the East India Company's charter was under consideration, the feeling of the English nation, aroused to the responsibility for this distant possession, found free expression. In the year following the education of the whole people of India was assumed as a state duty, and the Court of Directors " laid down with fulness and precision the principles that were to guide the Indian Government in the performance of this great task." Their dispatch of 1854 forms the permanent charter of education in India. In a sense this celebrated document was simply the declaration of principles drawn from the experience of a century, and already formulated in Lord Macaulay's Minute and in orders issued by Lord Bentinck and Lord Auckland, acting in their capacity as Governors-General. But the Minute of 1854 gave to these principles the commanding sanction of the British government, and expressed the conviction and will of a nation. The main features of the policy thus announced were: (1) the constitution of departments in the several provinces or presidencies for the administration of education; (2) the establishment of universities at the presidency towns; (3) the support of training schools for teachers; (4) the maintenance of the existing government colleges and high schools, and the increase of their number when necessary; (5) the establishment of new middle schools; (6) increased attention to vernacular schools, indigenous or other, for elementary education; (7) the introduction of a system of government grants in aid; and (8) inspection and periodical reports.

The instructions advised the largest freedom to local initiative, and insisted that government aid for education should supplement and be proportioned to the local expenditure. The importance of higher education was emphasized both in deference to the spirit of the people and as a means of preparing natives to enter in due proportion upon administrative and official careers; the importance of female education was urged, and as regards government institutions, it was ordered that the "education conveyed in them should be strictly secular."

Special reference was made in the dispatch to the need of colleges of medicine and civil engineering, and grants were authorized for schools of industry and design after the model of schools maintained by Dr. Hunter at Madras, and by Sir Jamsetjee Jeejeebhoy at Bombay. The plan worked out by Dr. Monat of the Bengal committee, for an agricultural division in each *zillah* or district school, was also endorsed. It was an all-inclusive scheme anticipating demands which have not yet been fully met in highly advanced nations, and which in India had necessarily to wait upon the slow disintegration of long-established institutions, customs, and prejudices.

In 1858 the East India Company ceased to exist and the government of India passed to the Crown. There followed the Dispatch of 1859, issued by the Secretary of State for India, which reiterated and confirmed the provisions of the earlier dispatch, with a single exception. The grant-in-aid system had failed to promote vernacular education, and it was declared that this purpose could only be realized by the direct action of the provincial governments.

The Commission of 1882. — The system of education, started under government auspices and aided by grants from the general treasury, was mainly dependent for its development upon the education departments of the several provinces. These departments naturally favored the interests of higher education, which course accorded with the prevailing native tendencies. For fifty years very little progress was made in the work of popular instruction; a mere fringe of the people in the immediate vicinity of the presidency towns was reached. Moreover, the select company of native students that passed through the schools and colleges, so far from helping to raise the average level of the nation, were drawn away from its vital concerns. The education problem was complicated, also, by other conditions fostered by English rule, especially as these had tended to exalt the Hindu race, the powerful Marathas of the south and the quick-witted Bengali, above their former masters, the Mohammedans. The menace of the situation was fully comprehended by Lord Ripon, Viceroy of India from 1880 to 1884, and in the second year of his administration he created a commission charged with the duty of examining into the educational system and advising as to the means of overcoming the dense ignorance of the masses and welding together the antagonistic races by common interests and sentiments. The Commission, which was remarkable both in its membership and its exhaustive methods, adhered strictly to the principles of the Dispatch of 1854, but urged as a matter of supreme importance the spread and financial support of primary education. For this purpose it was declared that native methods must be followed; particular attention paid to the education of women; the confidence of the Mohammedans secured; and the backward races brought under modern influences. The most important outcome of the labors of this commission was the increase of the central authority in the general direction of education. The change in this respect is indicated by the series of quinquennial reports on the progress of education in India issued under government orders, the first of the series covering the period 1881–1882 to 1886–1887, and by the creation in 1902 of the office of Director-General of Education in India.

The Commission of 1904. — The resolution of 1904 was the outcome of special inquiries and conferences ordered by Lord Curzon, in view of unsatisfactory conditions disclosed by the third quinquennial report (1892–1893 to 1896–1897) on the progress of education. From this report it appeared that after a temporary advance, primary education was on the decline. The political development that had taken place since 1882 made the evil more alarming than at the earlier date; at the same time the relation of primary education to the entire system was more fully comprehended than ever before. The higher institutions had stimulated an artificial craving for official life, and like the inferior schools had failed to reach the vital interests of the country, its industrial needs and social welfare. Hence the Resolution comprehended the whole system in a common criticism and called for reform in its conscious aims and formal processes. Special stress was placed upon the need of higher schools of agriculture and technical arts; upon instruction in science and its practical applications which foster observation and reflection upon natural phenomena as a feature of secondary schools.

The resolution voiced the convictions of many of the leading minds of the Empire; but it went far beyond the expression of opinion, and in no uncertain terms declared the purpose of the viceroy to employ all the forces at his command for the accomplishment of the proposed reforms. The sincerity of this purpose is indicated by subsequent reports. These ceased to be merely exhaustive summaries, and gave signs of vigorous activity. This is especially true of the series of occasional reports issued from the office of the Director-General. These deal with particular phases of education, point out defects, furnish suggestions, and follow instruction with the record of expert inspection. The effect is seen in the practical tendencies everywhere imparted to education and in increased appropriations for the work. The example is followed by native chiefs who are responsible for education in their respective states. In schools for princes conducted under the joint supervision of British and native authorities, these future rulers become habituated to western ideas and not only apply the educational system of the British provinces to their own states but in several instances set the advanced pace.

Features of the System. — The reduction of the provincial reports on education to a unified scheme of statistical presentation was one of the chief outcomes of the Commission of 1882. Maintained by the subsequent quinquennial reports, this scheme makes it possible to grasp the common features of the system of education as it has worked out in the different provinces, and thus to form some conception of the state and progress of the work in spite of its magnitude and almost infinite variety of detail.

Administration. — The Director-General of Education in India has no authority over schools and colleges, the work of his office being that of general supervision and advice, made effective by his voice in the distribution of government appropriations for education. The provincial education departments administer the government appropriation and have general direction of public education in their respective divisions, and, in some cases, the direct management of public schools. As a rule, however, these are under the control of district, rural, or municipal boards. Departmental supervision is maintained by means of inspectors, of whom the larger proportion are recruited in England. The principals of the government colleges, and a certain proportion of the professors are also drawn directly from England.

By their examinations and the power of affiliating colleges, the universities have from the first controlled the system of higher education. Additional powers were conferred upon them by the Universities Act of Mar. 21, 1904, embodying the reforms proposed by the resolution issued by Lord Curzon. The act authorized the universities to institute regular inspection of the colleges and provide for their transformation into teaching bodies with power to make full provision for the promotion of study and research.

Colleges and secondary schools come within the sphere of university influence. The colleges are subdivided into (*a*) arts colleges, of which the majority are English, and a few oriental, and (*b*) professional colleges of law, medicine, and engineering. Their courses of instruction are regulated by the degree examinations. Secondary schools are subdivided into (*a*) high and (*b*) middle schools; the former teach up to the matriculation standard and are all English schools. The middle secondary schools may be either English or vernacular schools; the latter correlate with the primary schools and in the majority of the provinces are classed with them. There are also special schools, of which the most important are for training teachers; others are technical and industrial.

All schools and colleges recognized by the education department are classed as public; hence, the term applies to institutions established and maintained by public authorities, and also to those under private management which conform to the official regulations. The latter, which are established and conducted by religious or other associations, and also by private individuals, may be aided by public funds, or unaided and simply recognized.

It is necessary to have these distinctions in mind in order to understand the detailed statistics presented in the government reports; they are of interest also as illustrating the course of the English government in utilizing all the agencies of education and gradually bringing them into a well-ordered system. The distinction between institutions under public and those under private management may, however, be disregarded in a summarized statement of their operations.

Sources of Income. — The expenditures for education are met by (1) provincial revenues; (2) local or district funds; (3) municipal funds; (4) fees, and (5) other private funds. Provincial revenues consist of that portion of general taxation allotted to a province which the local government devotes to education.

Local funds properly consist of that portion of local taxation which district or local boards devote to education. The system of local taxation varies greatly in the several provinces. In some cases there is a fixed cess, or rate, on agricultural lands for education; in others, a proportion of the general land tax (cess) must be devoted to education; in others, tolls and similar levies take the place of a land tax. Municipal funds simply consist of that portion of municipal taxation which is devoted to education. One of the features of the visit of the King-Emperor to India in 1911 was the announcement of a grant of fifty lakhs ($1,666,665) "to the promotion of truly popular education." Further grants in future years are also promised.

Operations of the System. — *Enrollment* — From the latest quinquennial report covering the period 1902 to 1907, it appears that the enrollment in all classes of institutions sustaining any relation to the government was, at the latter date, 4,744,480. If to this number be added the 644,152 students in schools known to, but having no relation with, the education department — that is, Arabic, Sanskrit, and indigenous vernacular schools, the grand total is 5,388,632, pupils and students. Disregarding the independent indigenous schools, the distribution of the pupils in the different classes of public institutions at the beginning and end of the period covered by the quinquennial report, and also for the later year 1908, is shown in the following table: —

PUPILS BY CLASSES OF INSTITUTIONS

	1901–1902	1906–1907	*Per cent of Increase*	1908
Arts colleges . . .	17,651	18,918	7.1	25,736
Professional colleges	5,358	6,250	16.6	
Secondary schools .	622,768	713,342	14.5	754,267
Primary schools . .	3,204,336	3,937,866	22.9	4,199,14
Special schools . .	36,380	68,104	87.0	102,002
Total	3,886,493	4,744,480	22.0	5,708,238
Number in institutions under private management . .	2,646,852	3,088,513	16.6	
Number in institutions under public management . .	1,239,641	1,655,967	33.5	

Relative Status of the Several Provinces in Regard to Education. — While the recent action of the central government of India has imparted vigor and unity to the educational work, it is, after all, an interest over which each province has independent control; hence, for an adequate conception of its development each province should be viewed separately. The following summary, covering the enrollment in all classes of institutions by provinces, may suffice to show the relative extent and vigor of modern education in each.

The statistics following fall into two groups: one pertaining to popular education as the term is generally understood; the other to the education of those classes from whom the directive forces of the Empire, the professions, the civil service, etc., are recruited.

PROVINCES	POPULATION	PUPILS IN PUBLIC INSTITUTIONS		*Ratio of total pupils in 1906–1907 to population*
		1901–1902	1906–1907	
				per cent
Madras . . .	38,210,362	740,628	875,666	2.3
Bombay . . .	25,471,368	568,902	646,777	2.5
Bengal . . .	52,669,869	1,548,022	1,215,014	2.3
United Provinces	47,691,782	368,495	536,897	1.1
Punjab . . .	20,330,339	182,303	234,895	1.2
Burma . . .	10,477,508	162,748	227,128	2.2
Eastern Bengal and Assam .	30,788,134	102,463 [1]	749,687	2.4
Central Provinces and Berar . . .	13,319,519	195,652	237,100	1.7
Coorg	180,607	4,325	4,355	2.4
North-West Frontier Province . . .	2,125,480	12,955	16,961	0.7
Totals . .	241,264,968	3,886,493	4,744,480	2.0

[1] Assam only.

The enrollment in primary schools is the natural index to the state of popular education in a country; but on account of the peculiar position of women in India, the number of girls in school must be disregarded in an estimate of general progress. The enrollment in schools for boys in 1907 was 3,631,000, equivalent to 20.5 per cent of the boys of school-going age. In other words, above fourteen million boys had not been brought into the primary schools. Nevertheless, the increase in this respect above 1902 was marked, amounting to 621,539, pupils, or an average annual increase of 124,307.

Primary Education — Formerly reading, writing, and elementary arithmetic were the limit of attainments for pupils in the vernacular schools. At present the following additional subjects are compulsory in the number of provinces indicated in each case by parenthesis: Kindergarten methods for infant classes (4); drawing (4); object lessons (5); geography (7); history as a separate subject (3); singing and recitations (2); hygiene (4); agriculture, either alone or included with object lessons (7); additional science subjects (2); mensuration (4) ; physical exercises (7). The following are optional in several provinces, but nowhere compulsory: English, Persian, and manual work for pupils above the infant classes.

This increased scope has been accompanied by special adjustments of the programs to the different demands of urban and rural life and by endeavors to excite the interest of pupils and parents in what are termed " middle vernacular schools." These schools, which in some provinces are classed with the secondary schools, are the crown of the vernacular system; upon them depends the welfare of the lower schools, since they supply to the latter the best qualified teachers. The enrollment in the middle schools increased from 158,706 in 1902 to 184,132 in 1907, or 16 per cent. Their normal growth, however, is prevented by the fact that parents who are willing to keep their boys in school to the age of fifteen or sixteen years prefer an Anglo-vernacular school, since in most forms of clerical employment even a smattering of English has value. Unfortunately teaching pays less than the lower forms of clerical work, and this condition cannot be changed without an enormous expenditure. For the five years 1902 to 1907, the expenditure for primary education increased from 10,545,000 Rs. ($3,395,490) to 13,671,000 Rs. ($4,402,062); or from $1.05 to $1.11 per capita of enrollment. But this enrollment, as already shown, is a very small proportion of the total population of school age.

Teachers of Primary, or Vernacular Schools. — The official reports of education in India, as a rule, give very meager data with respect to the teachers employed in the primary schools. There is a traditional respect for the office which gives the teacher some advantage, but the changing standards of social values threaten to undermine this influence, and the pecuniary considerations are assuming more and more importance. Hence the slight increase in the pay of teachers is noted as the chief element of recent improvement in the conditions of the service. Provision for training teachers is also increasing, and there has been marked advance in the standards and methods of preparation for the work, so far at least as these are set forth in official regulations. Madras, the only province that has recently reported the item, had, in 1907, a force of 30,000 teachers in the 21,379 primary schools for boys, enrolling 692,409 pupils. This is at the rate of one teacher for twenty-three pupils. In 1902 it was found that the average throughout India was one teacher to every twenty-six pupils.

During the quinquennium, salaries have been improved in the schools of Madras under public management, and a system of grading has been adopted which offers prospects of promotion in schools employing more than two teachers. In small schools, where the grading cannot be applied, the trained teachers receive about two rupees a month more than the untrained teachers. Under this system the minimum pay is eight rupees a month; from this amount it rises by successive increments to forty rupees or from $2.59 to $13. In eastern Bengal and Assam the salaries range from three to ten rupees a month.

Teachers of Secondary Schools. — In respect to their financial status and qualifications, teachers of secondary schools differ radically from those employed in the vernacular or primary schools. As a rule, they are graduates of the colleges, and so far as possible the scholastic education is supplemented by professional training.

Training Colleges and Schools. — The total number of training institutions for men teachers reported in 1907 was 318, with an enrollment of 8225 students. In these totals are included six training colleges for masters of secondary schools, with an enrollment of 270 students. For women teachers there were sixty-three training schools, with 1297 students. The total expenditure for these institutions in 1907 was 1,141,045 Rs. ($369,698).

The Mohammedan Problem. — A favorable change in the attitude of the Mohammedans is indicated by the recent active coöperation on the part of many of their leaders in the provincial educational conferences; it may be inferred also from the fact that whereas in 1902 Mohammedans, who constitute 22.2 per cent of the population, furnished only 18.8 per cent of all pupils, in 1907 their proportion had risen to 19.5 per cent.

Education of Girls. — Particular interest attaches also to the increase in the number of girls brought into the schools and to the endeavors to adapt the instruction to their aptitudes and social relations. The advance in this respect is due in great measure to the aroused interest of high-class natives in the promotion of the cause. A signal indication of this interest was the organization of a Social Reform conference in 1888 to consider means of ameliorating the condition of women in India. The conference, which was attended by 6000 persons, mostly Hindus, was held at Bombay at the same time as the notable assembly of the Indian National Congress. At the meeting referred to, the latter, which has become an organ for the expression of national aspirations, numbered 1889 representatives from every province of India. They gave strong support to the Reform Conference, and spread the spirit of its purposes throughout India.

This movement reaches to the very root of the social life of the nation, and marks the breaking up of the most stubborn of its traditional customs. Statistics as yet furnish no real measure of its importance; they are, rather, valuable as a point of departure for estimating its future progress. The total number of girls in all classes of public institutions in 1907, *i.e.* 579,648, was an increase of 186,480 above the total for 1902. They were distributed as follows: 273 in colleges; 61,237 in secondary schools; 513,248 in primary schools; 1267 in training schools for teachers, and the remainder in other special schools. It is interesting to note that about forty-two per cent of the girls under instruction were attending schools for boys. The total enrollment was equivalent to 3.2 per cent of the girls of school age, as against 22.7 per cent, the corresponding ratio for boys.

Secondary Schools. — The courses of study in secondary schools are determined by the matriculation examinations of the universities. In several of the provinces measures have been taken to organize special courses in the secondary schools with a view to preparing young men for entrance upon business careers; but this movement has made little progress as yet, and fully 95 per cent of the boys who pass through the secondary schools pursue the course leading to the matriculation examination. It follows that secondary schools and universities, including the arts colleges and professional colleges affiliated to the latter, in which students pursue their studies after matriculation, represent a continuous course of liberal and professional education. The secondary or preliminary course of study to the matriculation examination is represented in the following scheme: —

COURSE IN SECONDARY SCHOOLS AS INDICATED BY THE REQUIREMENTS FOR MATRICULATION AT THE UNIVERSITIES. AGE FOR MATRICULATION 16 (MADRAS AND PUNJAB, 15)

Subjects [1]	Requirements by the Universities				
	Calcutta	*Madras*	*Bombay*	*Allahabad*	*Punjab*
English Mathematics	Compulsory	Compulsory	Compulsory	Compulsory	Compulsory
Additional mathematics	Elective	None	None	None	None
History and geography	Separate and Elective	Combined and Compulsory	Combined and Compulsory	Combined and Compulsory	Combined and Compulsory
A second language	Compulsory	Compulsory	Compulsory	Elective	Compulsory
A classical language	Compulsory	Alternative with a foreign language and elective	Alternative with French but one of the two compulsory	Elective	Compulsory
An additional classical language	Elective	None	None	Elective	Elective
An Indian vernacular	Compulsory	Elective and alternative with a classical or foreign language	Compulsory	Elective	Elective
Science	Elective	Compulsory	Compulsory	Elective	Elective

[1] The complete course is arranged for 10 years in the provinces of Madras, United Provinces, Burma, and Assam; for 11 years, Bombay, Bengal, and Central Provinces; for 9 years, in the Punjab.

Note. — Physiology and hygiene are elective at Punjab; agriculture and surveying elective at Allahabad; drawing at Allahabad and Punjab.

English in the Secondary Schools, Colleges, and Universities. — While the efforts to develop vernacular schools have not been fruitless, the teaching of English still remains the pivotal point of the government system of education. The stress of effort in the secondary schools is on this language. For example, of the total of 713,342 pupils (658,305 boys, 55,037 girls) enrolled in secondary schools, 423,317 (395,513 boys, 27,804 girls) were studying English, as against 164,031 taking a classical language and 611,391 (570,456 boys, 140,935 girls) a vernacular. Pupils who enter a higher institution pass the matriculation examination in which English is an invariable requirement. When the student has matriculated and entered college, his studies are pursued entirely in the English language, whether he chooses the arts or the science course. The only exception is the special course in oriental studies offered in the Punjab University. But of students in secondary schools, only a small number, about 11,000, annually pass the matriculation examination, and still fewer push on for a university degree. The desire for English is evidently the sign not so much of a passion for modern learning, as of the stronger passion for an immediate means of livelihood and a passport to the favor of the rulers.

Higher Education. — The number of advanced degrees conferred by the five universities in 1907 was 837. In this number Bachelor of Laws is represented by 638 diplomas, and Master of Arts by 195.

Movements in Higher Education. — Among the important movements in India is that which is furnishing new motives to student life. These are supplied not only by the reorganization of the universities, including the expansion of their medical and engineering courses, but also by the development of agricultural education. The first step in this direction was taken in 1901 by the appointment of an Inspector-General of Agriculture aided by a nucleus

TABLE SHOWING FOR EACH PROVINCE OF BRITISH INDIA THE NUMBER OF STUDENTS IN ARTS COLLEGES, AND THE RELATION OF THIS NUMBER TO THE ENROLLMENT IN SECONDARY SCHOOLS AND IN PRIMARY SCHOOLS

Provinces	Number of Students in Arts Colleges	For Every Student in Arts Colleges there are enrolled in	
		Secondary schools	*Primary schools*
		Pupils	Pupils
Madras	4687	26	158
Bombay	2747	21	211
Bengal	5190	30	233
Eastern Bengal and Assam	1197	96	511
United Provinces	3068	28	144
Punjab	1598	42	101
Burma	135	392	1272
Central Province and Berar	274	169	692
Coorg	0		
Northwest Frontier Province	22	270	499

staff of agricultural experts. A further impulse was given to the work in 1903 by the donation of $150,000 by an American gentleman, Mr. Henry Phipps, the greater part of which sum was devoted to the establishment of the Imperial Agricultural College and Central Research Institute at Pusa in Berar. In 1905 the government of India announced the intention of setting aside twenty lakhs of rupees ($644,000) annually for the development of agricultural experiment, research, demonstration, and instruction in India. Local governments and administrations were consulted as to the lines along which this development should be guided, and in an important dispatch, addressed to His Majesty's Secretary of State for India, the government of India defined its general policy.

The proposed scheme included the establishment in each important province of an agricultural college and research station, adequately equipped with laboratories and classrooms, and possessing a farm of suitable size, the institutions to be conducted on the same general plan as that of the central college at Pusa. Progress has already been made in the practical application of the scheme. The staff at Pusa has been recently increased by the appointment of a cotton specialist, and in the chief provinces a whole-time Director of Agriculture has been appointed, with a staff of assistants, consisting usually of the principal of the agricultural college, an agricultural chemist, an economic botanist, and one or two all-around agricultural experts. Nearly sixty experimental farms, in addition to the demonstration plots, have been established in various parts of the country.

Relations have also been established between the Education and Agricultural departments for the control of rural education, and arrangements have already been made in some of the provinces for training village schoolmasters, for short terms, either at an agricultural college or at the ordinary training college if the latter has a farm attached. A system of forestry schools (*q.v.*) in affiliation with the central school at Dehra Dun is also in course of development.

The educational conference called by Lord Curzon at Simla in 1901 laid great stress upon technical education, and as an immediate result a system of state technical scholarships was instituted. The recipients are sent abroad to pursue definite courses of instruction in subjects connected with industrial science or research. During the quinquennium fifteen scholarships were awarded, and they are now granted at the rate of ten annually.

There are at present in India no technical institutions of the highest order, but this want will be supplied by the Indian Institute of Science, to be located at Bangalore, Mysore. The project owes its inception to the liberality of the late Mr. J. N. Tata and his family, who have donated for the purpose property in Bombay estimated to yield an annual income of Rs. 125,000 (about $40,000) a year. The Mysore government and the central government have contributed liberally to the initial expenditure and permanent support of the Institute. It is intended primarily to be a center of post-graduate study and research, particularly in science, and conducted with a view to the application of science to Indian arts and industries. The constitution of the Institute will resemble that of a university which takes entire responsibility both of teaching and examination. Its diplomas will be restricted to its own students.

The material benefits of the English system of education are most strikingly shown in the awakened interest in the practical applications of science. To understand the spiritual change that is going on under the influence of new ideals it is necessary to study the Indian press, to follow the proceedings of the educational conferences, of the National Indian Association, of the Indian National Congress, and the scientific movements initiated and financed by native citizens. The new vernacular literature shows what British education has done for the preservation of the native tongues, and reveals the spirit of Western ideas and sentiments in a Hindu form. In like manner the new religious organizations, the Brahma Samaj and the Arya Samaj, embody religious conceptions borrowed largely from the West.

Notwithstanding frequent outbursts of wild or menacing passions on the part of native leaders, their social and political activities offer irresistible proofs of steady advance toward "a higher state of society and a nobler ideal of domestic and individual life." The movement thus summed up by Sir W. W. Hunter, one of the most eminent leaders England has furnished to this transforming Empire, has its root in the schools modeled after

English types. Its final stage is foreshadowed in the recent admission of Hindus to the government Council.

Cost of Public Education. — The total expenditure in 1907 was 559 lakhs of rupees ($17,999,200), as compared with 401 lakhs ($12,912,200) in the year 1902, an increase of 39.4 per cent in five years. Omitting cost of administration, and other items pertaining to the system as a whole, the direct expenditure on public education was 45,579,102 rupees ($14,512,071), which was applied as follows: for university education, including arts colleges and professional colleges, 10.4 per cent; secondary schools, 33.1 per cent; primary schools, 34.1 per cent; special schools, 7.7 per cent; for buildings and equipment, 14.7. The proportion of the total expenditure borne by each contributing source, as already defined, was as follows: by provincial revenues (including government appropriations) 33 per cent; by local funds, 16.4 per cent; municipal funds, 3.6 per cent; fees, 26.5 per cent; all other private sources, 17.5 per cent; additional public sources, 3 per cent.

The realization of the vital importance of education to the uplift of India was emphasized by the central government in 1902 by an assignment of 40 lakhs ($1,288,000) annually for this purpose. The greater part of this fund has been devoted to primary education. In 1905 the government made a definite assignment of 35 lakhs ($1,127,000) annually for primary education. At the same time 5 lakhs ($161,000) were assigned annually for universities and colleges, 2½ lakhs ($80,500) for European education, and 2½ lakhs ($80,500) for certain new departures in technical education. In addition, an appropriation of 20 lakhs ($644,000) is made annually to the agricultural department, a large part of which is devoted to the improvement of agricultural colleges. The local governments have supplemented these assignments by further provision from their own resources, so that the expenditure on education from public funds in the year 1907 was 296 lakhs ($9,531,200), as compared with 177 lakhs ($5,699,400) in the year 1902, an increase of 67 per cent in the five years.

No detailed report of this vast system operating in nine great provinces, comprising a population three times as great as that of the United States, has been issued since the fifth quinquennial report, already cited, which brings the record to 1907. Official summaries for 1908 which have been given in a foregoing table show an increase of 20 per cent in the total number of pupils in public institutions above the total for 1907. It is worthy of note that while there was very slight increase in the registration in colleges of arts and professional schools, the increase in special schools, which include normal schools and technical institutions, was very nearly 50 per cent. The total expenditure for public education, which was equivalent to $18,000,000 in 1907, reached $20,000,000 the following year.

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INDIA, TRAINING FOR SERVICE IN. — See Public Service, Training for.

INDIAN NUMERALS. — See Notation.

INDIAN TERRITORY. — Originally a separate territory, set apart largely for the homes of several of the civilized Indian tribes, but now included in the State of Oklahoma. Its area was 31,000 square miles, and its density of population in 1900 was 12.6 persons to the square mile. Of the total population in 1900, 77.2 per cent were white, 9.4 per cent were negroes, and 13.4 per cent were Indians.

See Oklahoma, State of. E. P. C.

INDIANA, STATE OF. — Indiana was organized as a separate territory in 1800, and was admitted to the Union as the nineteenth state in 1816. It is located in the North Central Division, and has a land area of 35,910 square miles. In size it is about three fourths as large as Pennsylvania, and four and one half times as large as Massachusetts. For administrative purposes, it is divided into ninety-two counties, and these are in turn divided into townships. Cities and incorporated towns are usually segregated parts of a township. In 1910 Indiana had a population of 2,700,876 and a density of population of 75.2 people to the square mile.

Educational History. — The first school in the territory of which there is any record was taught by a French missionary at Vincennes in 1793, and the second school was opened at Charleston in 1803. The first act of an educational nature was passed by the first territorial legislature, meeting at Vincennes, in 1806. This established the Vincennes University, and gave to the new institution the seminary township granted by act of Congress in 1804 for the benefit of an institution of higher learning in the territory. This institution was opened in 1810, maintained a feeble existence for a time, and in 1824 was declared extinct and its lands forfeited for the benefit of the new Indiana Seminary, afterwards University, at Bloomington.

The constitution adopted in 1816 was particularly noteworthy in that it was the first to throw careful safeguards around the various lands given by Congress to the state for education, and in that it laid a mandate on the legislature, " as soon as circumstances will permit, to provide by law for a general system of education, ascending in regular gradation from township schools to a State University, wherein tuition shall be gratis and equally open to all." In 1816 the first school law was adopted. It merely provided for the appointment of a superintendent of the school section in each congressional township, who was to attend to the leasing of the land, and that, on petition of twenty householders in any congressional township, an election should be held to elect three trustees for the township, who were to open schools and to encourage education. As no means of securing school revenue were provided, however, the law remained a dead letter. In 1818 the Governor was instructed to appoint a seminary trustee for each county, who was to accumulate and invest funds with a view to providing a county seminary for each county. In 1824 another law was enacted, which made the system consist of rural schools, the county seminary, and the state seminary; definitely provided for the election of three trustees in each township; and made the beginnings of the district system by giving the trustees power to subdivide the township, locate school districts, appoint district trustees, erect schoolhouses by the manual labor of able-bodied residents, and examine teachers for the schools of the township. This is the first general school law for the state. Again no funds were provided, so that any schools that were opened were supported by the rate bill and by private subscriptions.

In 1833 the district system was definitely substituted for the township system. Each district was to elect three district trustees for one-year terms, who should examine the teachers and manage the school. Each district could determine whether or not it would have a school, and no one was liable for school taxes unless he sent children to school Religious and private schools were to share equally in the school revenue. By the laws of 1836 and 1837, householders might make contracts with teachers to teach their children, under certain conditions. In 1841 the culmination of the process of decentralization was reached by the enactment of a law which made the requirement of a teacher's certificate optional with the district trustees. In 1831 the beginnings of county supervision were made in a law which provided for the election of a school commissioner for each county, for a three-year term, whose duty it was to look after the funds of the local school corporations. In 1837 the beginnings of a county system for the examination of teachers was made by a law authorizing the circuit courts to appoint annually three examiners for each county, but district trustees were still allowed to give such further examinations as they saw fit. In 1843 the first state supervision was instituted by the designation of the State Treasurer to act *ex officio* as Superintendent of Common Schools, though the duties assigned to him were almost entirely financial. In 1841 all the property of the district was made liable for a district tax to build a schoolhouse, and the year 1849 marked the partial establishment of the principle of general taxation for schools. At the fall election of 1848 a popular vote of the state was taken on the question "Are you in favor of free schools?," the result being 78,523 for and 61,887 against. As an outcome of this vote, an optional law was enacted which provided for a general tax of ten cents on all property, and a poll tax of twenty-five cents, this to remain in the counties where paid, and further permission was granted to levy a local tax for school buildings, furnishings, and tuition. The law was not to go into effect in any county until accepted by an affirmative vote of the people, which was finally done in 61 per cent of the counties. In counties accepting the law, the office of county school commissioner, established in 1831, was abolished, and his duties transferred to the auditor; the number of district trustees was reduced from three to one to the district; and a detailed system of reports and blanks was provided with a view to securing better administration. This law marks the beginnings of a change from the policy of decentralization which began in 1824 and reached its culmination in 1841.

Very little educational progress had been made under the old constitution, and the proposal to hold a convention to frame a new constitution was seized upon as an opportunity by the friends of education. The new constitution of 1851 made it the duty of the legislature "to provide by law for a general and uniform system of schools, wherein tuition shall be without charge, and equally open to all"; enumerated the items that were to constitute the common school fund, and declared it to be a perpetual fund; forbade special and local legislation with reference to schools and school funds; and provided for the election of a State Superintendent of Public Instruction by popular election for two-year terms. The constitutional provisions with reference to education have remained unchanged since then.

The school law of 1852 contained the substance of the present system. A state school tax of ten cents, to be distributed on census, and local building and tuition taxes were provided for, and township libraries established. In addition to the office of State Superintendent of Public Instruction, a State Board of Education was created, a body which has done more than anything else to establish the present well organized system of the state. At first it was made up of state officials, but in 1865 it was changed to an *ex officio* body of school men. The development of the schools was somewhat retarded by a decision of the Supreme Court in 1854 that all local taxes for support were unconstitutional, and from then until 1867, when practically the same law was reënacted and later held to be constitutional, no local taxes could be levied to prolong the term or to provide better facilities. In 1854 the State Teachers' Association was organized; in 1859 the number of township trustees was reduced from three to one; in 1861 county examiners were given larger power in regulating the issuance of licenses to teach; in 1865 county teachers' institutes were begun; in the same year the State Superintendent gave up the power to grant local licenses, and the State Board began to issue state certificates; in 1865 the state normal school was established, and opened in 1870; in 1872 the first township high school was started; in 1873 the office of county superintendent was created out of the office of county examiner, provision was made for the organization of separate city school systems with power to employ a city superintendent, and the State Board of Education began to commission high schools; in 1889 kindergarten and night schools were authorized, and the State Board of Education was created a State Textbook Commission to select a uniform series of textbooks for the schools of the state; in 1894 a state course of study was issued; in 1897 the first compulsory education law was passed; in 1899 the county superintendent's term of office was extended to four years and educational qualifications were established for the office, the use of uniform examination questions furnished by the State Board of Education was made mandatory, and definite recognition of high schools was made in the state law; in 1901 the time of attendance required by the compulsory attendance law was changed from twelve weeks to the entire school session; and in 1907 a minimum wage law was enacted and the State Board of Education was created a State Training School Board, with power to designate institutions as training schools, and with a view to requiring all teachers in the state to secure some kind of professional training. In 1911 an optional medical inspection law was passed; county superintendents were given a fixed salary instead of a *per diem*; and a state agricultural and industrial commission was created. Along with all these changes has come a great change in the attitude of the people of the state toward public education, which has done much to make educational progress possible.

Present School System. — At the head of the school system is a State Board of Education and a State Superintendent of Public Instruction. The State Board is composed of the Governor, the Superintendent of Public Instruction, the presidents of the state university, Purdue University, and the state normal school, the city superintendents of the three largest cities, and three citizens of prominence engaged in educational work and appointed by the Governor, one of whom must be a county superintendent. The Superintendent of Public Instruction is president of the board and acts, in part, as its executive officer. This board has gradually, by careful and intelligent work, secured large authority for itself and has done very valuable work in fostering new and desirable educational undertakings. The board is charged with the duty of considering practical school questions; of examining teachers for state certificates; of preparing examination questions to be used by all county superintendents in the examinations for county certificates; and of examining and commission-ing high schools. The board also acts *ex officio* as a State Board of Textbook Commissioners, to adopt uniform textbooks for the schools of the state, fix their sale price, and make contracts with publishers; and as a State Training School Board, to accredit institutions to train teachers for the various kinds of schools of the state, to prescribe courses of study, etc.

To the State Superintendent of Public Instruction is given the general supervision of the schools of the state and the care of the school funds; he must visit each county once in two years and examine the auditor's books and ascertain the condition of the school funds; prepare blanks and forms and prescribe methods of bookkeeping; apportion the school funds semi-annually to the counties; decide appeals from the county superintendents; and make a biennial report to the legislature and an annual report to the Governor. He also serves *ex officio* as a member of the Board of Trustees of the State Normal School.

In each county there is a county superintendent of schools, elected for four-year terms, by the township trustees. He must hold at least a three years' teachers' license to be eligible. He conducts eight public examinations each year for county teachers' licenses, using questions furnished him by the State Board of Education; decides appeals from the decisions of township trustees; provides for the examination of all graduates from eighth grade and from the town and township high schools of the county; conducts an annual teachers' institute; holds a preliminary institute of the teachers of each township before the opening of schools, and visits each township institute once each year; visits schools; carries out the instructions of the State Board and the State Superintendent; inspects the county books to see that the school funds are properly preserved; and makes an annual report to the State Superintendent and to the State Bureau of Statistics. A county board of education, consisting of the county superintendent, township trustees, and the chairmen of the town and city boards of education of the county, meets semi-annually with the county superintendent to consider the general wants and needs of the schools, and all matters relating to the purchase of school supplies.

Each county is divided into townships, cities, and towns. For each township one township trustee is elected by popular election. He has charge of the roads, bridges, poor relief, and schools of the township. He has general charge of the educational affairs of the township; power to locate and establish a sufficient number of schools; may establish a township high school if he has twenty-five grammar school graduates in the township, or may unite with other township trustees for the purpose; must maintain a six months term and shall authorize a sufficient tax for the purpose, within the limits set by law; may abandon schools and transport pupils with the consent of a majority of the residents of the school district; must take an annual school census; may transfer children and their funds to other townships; employs teachers and makes contracts with them in writing, according to the minimum wage law; and must make a detailed annual report to the county superintendent and the board of county commissioners.

Cities and incorporated towns are governed by separate and distinct school officials, though otherwise operating under the general school law, unless of over 50,000 inhabitants, in which case they may have special laws relating to the form of government. The city council, or board of town trustees, appoints three school trustees, one each year for three-year terms, to manage the schools. They have the same duties and powers as township trustees, and, in addition, may establish night schools in a city of over 3000 inhabitants, kindergartens in one over 6000, and a system of industrial training in one over 50,000. Cities of 100,000 or over are governed by a board of five school commissioners, nominated by petition and elected by the people, and to them are given certain large powers.

For each subdistrict in the township, the school director is elected by the parents each year, or appointed by the trustee if the parents fail to elect. The meeting of parents may also add additional branches of study to the course of instruction of the school; designate the time of year at which they desire the school to be taught; direct that repairs be made; and petition the township trustees to move, sell, or repair the schoolhouse, or to dismiss the teacher. The school director presides at all district meetings; serves as a means of communication between parents and township trustees; repairs the schoolhouse and provides fuel and supplies; and suspends or expels pupils.

The State Board of Education, acting as a State Textbook Commission, adopts a uniform series of textbooks for the elementary schools of the state for ten-year periods, copybooks, histories, and geographies excepted, these being adopted for five-year periods. A depository is designated in each county, and from this books are sent out to dealers and trustees throughout the county for sale. All schools in each township, cities and incorporated towns excepted, must be taught an equal length of time. The Bible is not to be excluded from the public schools of the state. Colored children may be taught with other children, or in separate schools, as communities may prefer.

School Support. — The state originally received 650,317 acres of land from the sixteenth section grant, but most of this was sold when the state was very poor, and brought but little. The total grant has produced a little less than two and a half millions of dollars. The state also received $860,254.44 from the Surplus Revenue of 1837, one half of which was added to the permanent school fund. From swamp lands, saline lands, bank taxes, fines, forfeitures, and escheats, additional amounts have been added, so that the total permanent fund at present amounts to about eleven millions. The interest on the Congressional Township Fund is distributed to the townships to which the fund belongs, but the interest on the remaining school fund, together with 94.8 per cent of the state school tax of 13.6 cents, is distributed to the different counties of the state, and from the counties to the townships, towns, and cities, on the basis of the number of children reported between the ages of six to twenty-one. The remaining 5.2 per cent of the state tax is held as a reserve fund, to aid poor and deserving districts to enable them to bring their school term up to the minimum required by law. All state money must be used for teachers' salaries only. No county school tax is levied, but the surplus dog fund and license fees go to the school fund of the county. Trustees in townships, towns, and cities up to 100,000 inhabitants, may levy additional local taxes up to fifty cents on the $100 and a poll tax of fifty cents for extending the school term (tuition fund), and a similar tax but with $1 poll for buildings, supplies, and other expenses, including salaries. Cities of over 100,000 inhabitants may levy up to fifty-seven cents for all purposes. About two thirds of the total revenue comes from local sources.

Educational Conditions. — The state, generally speaking, has relatively good educational conditions. There is but a small percentage of foreign born in the state (5.8 per cent), and these are largely settled in a few districts, and in the wealthier part of the state. There are but few negroes (2.3 per cent), and these are mostly in cities, which renders the problem of the education of the colored race easy to handle. Agriculture and manufacturing are the chief resources. Of the total population about 65 per cent live in country districts. The southern third of the state is much poorer than the central and northern portions, and has much greater difficulty in maintaining its schools.

The compulsory education law, which requires that all children, seven to fourteen years of age, must attend school during the time the schools are in session, is well enforced in the cities, and fairly well enforced elsewhere. The county board of education in each county is constituted a board of truancy for the county, instructed to appoint one truant officer, and charged with the enforcement of the law. Cities of 5000 constitute separate truancy districts, and all cities may appoint truant officers to enforce the law. If children are too poor to attend school, the township trustee or the city board of education must provide books and clothing. Homes for incorrigibles and confirmed truants may be established and a special tax levied for their maintenance.

The average value of the schoolhouses of the state was about $3300 at last report. This has advanced rapidly within recent years, owing to the abandonment of many poor and small buildings and the substitution of one well-built central consolidated school in their stead. The movement for the consolidation of schools and the transportation of pupils to a centrally located school has made very rapid headway in Indiana, some of the best consolidated schools in the country being found in that state.

Practically all schools outside of cities follow a uniform state course of study, which is issued by the State Superintendent, along with a series of directions and bi-monthly questions on the work to be covered. The required monthly township institute also tends to unify the work of the schools. The schools are well graded, and high schools are numerous. Manual training is taught in nearly all of the cities and in many of the town and rural consolidated schools. Instruction in domestic science is also given in many places. There are many public libraries in the state, a Public Library Commission has charge of the public libraries provided by the state, and liberal township and city taxes for library purposes are allowed. Each community may do as it desires with reference to providing separate schools for the colored race, but equal educational facilities must be provided. While sectarian or denominational instruction is not allowed, the law provides that " the Bible shall not be excluded from the public schools." Private and parochial schools are required to report statistics to the county and state school officials. These schools exist chiefly in the cities, and enroll but about 3.5 per cent of the total enrollment of the state.

Teachers and Training. — The yearly salaries paid have increased 50 per cent in ten years, being now, on an average for all teachers, about $500. This is due in part to the minimum wage law, which now requires trustees to sign written contracts with teachers, with a $100 fine if the contract is made at a lower rate than the minimum wage allowed by law. No statistics are available from which the percentage of teachers in the state who have had normal training can be determined. The minimum wage law of 1907 provides that all new teachers must have had a high school education or its equivalent, and have had in addition twelve weeks in a professional training school for teachers in the case of all beginners, twenty-four weeks in the case of those paid on the basis of three cents, and must be graduates of a professional school to receive salary on the basis of three and one half cents. (The basal minimum is multiplied by the grade made in the examination for the respective licenses to give the daily wage.) The State Board of

Education is designated as a State Training School Board, to define standards and equivalents, designate institutions in which the professional work may be done, and to outline professional courses of instruction. In addition to these designated institutions, the state maintains a large state normal school at Terre Haute.

For the improvement of those in service, besides the monthly township and the annual county institutes, there is the Indiana Teachers' Reading Circle, organized in 1883, which is one of the most successful organizations of its kind in the United States. Though conducted by the State Teachers' Association, its work has been accepted by the State Board of Education, and forms a part of the examination questions for teachers' licenses. About 85 per cent of the teachers of the state are members of the organization. The Young People's Reading Circle, a branch for children, was organized in 1887.

Secondary and Higher Education. — The high school has had a large development in Indiana, there being 730 high schools in 1910 with 2054 teachers employed. Of these 519 were township high schools and 355 were fully accredited four-year high schools. This development is due in large part to the wise policy of the State Board of Education, which fostered and aided the movement years before the high school was incorporated into the state school system. A commissioned high school must have a certain equipment and a four-year course of study, at least two teachers, and at least an eight months term, and the graduates of such schools are accepted into the different state and private institutions of higher learning without examinations. Some of the noncommissioned high schools lack only in length of term, while others are two and three-year schools in process of evolution. Seven cities maintain high schools for the colored race, and four cities maintain manual training high schools. The money for the support of high schools comes from the same sources as that for common schools.

At the head of the school system of the state is the State University of Indiana (*q.v.*) at Bloomington, opened in 1824. Purdue University (*q.v.*) at La Fayette, opened in 1874, which owes its origin to the Land Grants of 1862, is a second higher institution, supported by the state. There is also a number of old denominational colleges in the state which share with the state institutions the work of higher education, and a number of private normal schools which offer academic and normal work.

INSTITUTION	LOCATION	OPENED	CONTROL	FOR
Wabash College	Crawfordsville	1832	Non-sect.	Men
Hanover College	Hanover	1833	Presby.	Both sexes
De Pauw Univers.	Greencastle	1837	M.E.	Both sexes
Concordia College	Fort Wayne	1839	Luth.	Men
Univ. of Notre Dame	Notre Dame	1842	R. C.	Men
Taylor Univers.	Upland	1846	M. E.	Both sexes
Earlham College	Earlham	1847	Friends	Both sexes
Franklin College	Franklin	1833	Non-sect.	Men
Butler College	Indianapolis	1855	Chr.	Both sexes
St. Mary's Col. and Academy	Notre Dame	1855	R. C.	Women
Moore's Hill Col.	Moore's Hill	1856	M. E.	Both sexes
St. Meinrad Col.	St. Meinrad	1857	R. C.	Men
Union Christian Col.	Merom	1859	Chr.	Both sexes
Rose Polytechnic Inst.	Terre Haute	1883		Men
Oakland City Col.	Oakland City	1891	Bapt.	Both sexes
St. Joseph's Col.	Collegeville	1891	R. C.	Men

Besides the two state institutions, the state maintains the Indiana State School for the Deaf at Indianapolis, founded in 1843, the seventh of its kind in the United States; the Indiana State School for the Blind at Indianapolis, founded in 1846; the Indiana School for Feeble-minded Youth at Fort Wayne, founded in 1887; the Indiana Soldiers' and Sailors' Orphans Home at Knightstown, founded in 1867; the Indiana Reform School for Boys at Plainfield, founded in 1867; the Indiana Industrial School for Girls at Indianapolis, founded in 1869; and the Indiana Reformatory, established in 1906, an institution for neglected and wayward children, and an outgrowth of the compulsory education law.

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E. P. C.

INDIANA STATE UNIVERSITY, BLOOMINGTON, IND. — The first constitution of the state, adopted in 1816, made provisions for a state university as a part of the public educational system. In 1820 a state seminary, later called Indiana College, was founded. By act of the General Assembly, 1838, Indiana College was raised to the rank of a university, and in 1852 was officially recognized as the state university. In 1856 as the result of a lawsuit the university was deprived of a part of its lands, and the loss was made up by a new grant from the federal government, which secured the future development. After a brief setback during the Civil War, progress continued. The Federal Land Grant of 1862 created some difficulty, since the university was at the time not definitely prepared to meet the requirements of the act. A new institution was founded through a gift of Mr. Purdue, to which the federal grant was assigned. In 1867 the first state appropriation was made to the university and in that year women were admitted to the classes. The Indiana University School of Medicine was established in 1903 and gave a two years' preparatory course. In 1908 the Indiana Medical College, located at Indianapolis, was united with it under the title of the former. Under the administration of President David Starr Jordan, who entered office in 1885, the university advanced to the rank of the leading institutions. In 1889 the school of law, which had been discontinued, was revived with a three-year course. In 1895 and 1903 the revenue from the state was increased, the university receiving four elevenths of a tax of two and three fourths cents on every one hundred dollars of taxable property. In 1908 the School of Education was established. The government of the university is in the hands of a board of trustees elected partly by the State Board of Education and partly by the body of alumni since 1891. The departments of the university are the college of liberal arts, school of education, graduate school, school of law, and school of medicine. The admission requirements are sixteen units. Candidates are admitted by certificate from commissioned high schools (see HIGH SCHOOLS, ACCREDITING OF) or by examination. The college gives the following courses leading to the A.B. degree — classical, commercial, chemical, engineering, arts-law, arts-medicine, journalism, pedagogy. A summer session is also maintained. The enrollment in 1909–1910 was 2564, distributed as follows: college, 1828; graduate school, 137; school of law, 143; school of medicine, 248; school of education, 236. The faculty at Bloomington consists of seventy professors and more than a hundred junior officers of instruction.

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INDIANS, AMERICAN, NATIVE TRAINING. — (The general discussion of the education of primitive peoples is given under that title. The present article is limited to the discussion of the concrete practices of selected American tribes by one who was educated under the conditions he here describes.) It is generally assumed that the American Indian had no definite standards of his own, by which to measure life and initiate the young into the tasks and philosophy of the race. This is not true. His ideals were surprisingly high, and he found it impossible to accept the material gains of a "superior race" without spiritual loss. For them he has sacrificed against his will the simplicity and the generosity of his manhood.

Nature gave to our mothers strength of body, and that sure intuition which led them to absorb and to transmit to the unborn all that is most vital and profound in the breathing universe. Silence and solitude in the surroundings of the young wife — the expectant mother; a hush that was only broken by the sighing of the pine wood or the thrilling orchestra of the distant waterfall — these were the foundation of our spiritual training. Again in solitude and silence we learned to rise to that which is beyond ourselves — the mysterious and holy! In due time the child is born, and becomes at once the center of the family. To this rude cradle the whole clan pays its respects, as the latest comer from the Mysterious, the Great Giver of all life. The mother will never allow any other duty or pleasure to interfere with her duty to her child. From the moment that its wondering eyes opened upon her in the wilderness, she has accepted a sacred trust. She straps the cradle to her back while busy with her household duties, or suspends it from the bough of a tree, where she can still see and talk to the little one, ever pointing him to nature, and beyond to nature's God. He is taught from infancy that he is brother to the animal people, — the innocent, dumb creation, — and that the trees and the rocks are the embodiments of a mysterious Power, and therefore worthy of reverence. Above all things he must seek spiritual guidance fasting and in solitude; he must honor and respect his elders, and learn to hold his peace. Words are weak, but silence is perfect equipoise, the evidence of a perfect self-control, and it is silence the Indian cultivates. He is admonished to be truthful and chaste, to love his country more than life, and never to violate the trust of a friend. There was much of the stoic in our philosophy, and of the ascetic in our ideals. The boy is early forbidden to say or think:

"This is mine!" He is taught that the love of possessions is a weakness to be despised, and that one should desire to have only in order to give. This law forever wiped out from the Indian mind all commercialism and every possibility of material progress under tribal conditions. Trained to divide his last mouthful, he could not easily compete with his brother in a brutal and selfish struggle for existence.

In order to be a perfect man, one must have a perfect, symmetrical, and efficient body. This demands absolute self-control in eating and in all the pleasures of sense. The Indian exercised constant self-denial, and accustomed himself to continual and severe exercise from the age of six to sixty. His courage was early developed so that he should fear neither pain nor death. Living the natural life, he had no false modesty; he was naked and not ashamed; his courtesy was from the heart.

When the boy is seven or eight years old, his father begins in earnest his training for manhood. He is occasionally called upon to fast for a day, and the father usually fasts with him for the sake of example and sympathy. They both blacken their faces for a sign, and the boy's comrades make the ordeal more difficult by secretly tempting him to break his fast. His nerves are tested and strengthened by awakening from sleep with a sudden war-whoop, or by sending him for water after dark in a strange country. Perhaps the father compels him to dodge around a tree trunk, while he sends arrows whizzing about his ears! His faculty for observation and reasoning is developed not alone by constant roving, but by close questioning as well. Each night he must be prepared to stand an examination on the things seen and learned in the woods that day. The language of footprints includes the distinction between the moccasin of different tribes, the age of the trail, and the probable intention of the traveler. In the case of an animal, one should tell the sex, the number of hours since he passed, and something in regard to the circumstances, as whether he was hunting or hunted. It was a common thing among us to be able to distinguish the footprints of members of one's own family, as well as to know that of any member of the clan from an outsider's. The position of the sun and stars and the ordinary weather signs and appearances must be mastered for a guide to time, direction, and locality. It is almost unheard of for an Indian to lose his way. He is carefully trained from an early age to be independent in the woods, so that he can take care of himself in an emergency. If he is belated and overtaken by darkness, he must know how to settle himself for the night without anxiety. He must be able to take fish and birds without a weapon, know where to look for edible roots, berries, and mushrooms, and how to start fire with pieces of punk or flint and knife. He is taught to make arrows for himself under the direction of his grandfather, who is usually his very good comrade, and later the bow, with which he assiduously practices the off-hand shot. He must also learn to throw stones accurately. The art of finding and outwitting the game is a more complicated one, in which he is systematically trained by his father, grandfather, and male kinsfolk. In physical training much stress was laid upon endurance, and the disproportionate muscular development of the white athletes was not desired. Swiftness and agility were essentials. The young warrior of our people might have posed as a model for the Apollo, and his sun-browned skin was as smooth and fine as satin. The jet-black hair received painstaking care, and among the Plains Indians sometimes attained extraordinary length.

He never knew when or under what conditions he might be tried, hence he must be a "minute-man" both in war and hunting. He was a public servant — one who would be forever disgraced if he failed to respond when called upon for difficult or dangerous service, in summer or winter, by day or night. He must be always ready; able to run without food or water, if necessary, and to sleep on frozen or wet ground, for such was his Spartan training. At the same time he had much personal liberty as a boy, and was rarely punished or severely scolded. We Indians, even in childhood, had a peculiarly sensitive dignity and intense self-respect, which was cultivated by our elders by every means within their power. The well-born child was distinguished and marked out for an honorable future by a series of festivals given by the parents to celebrate and announce every stage of childish progress, such as the first step, the first shot with bow and arrow, or the ear-piercing, which was a sort of christening ceremony. This gave him, while still very young, a sense of standing and responsibility as a recognized member of the clan.

His mental discipline consisted largely in memorizing the legends of his people and the brave deeds of their heroes, whether traditional or authentic, all of which he was expected to have at his tongue's end. In this tribal lore the wise and old men were the accredited teachers. The young man generally said very little, willing to remain an apprentice until he should be admitted to the war feast or the council, which he well knew must depend entirely upon his own courage and success. He had played with his sisters and girl cousins until he was twelve years old, but if he were seen with the girls after that age, the other boys would threaten to put a dress on him! It was now time to devote himself wholly to manly occupations, and he might even go upon the warpath as early as fourteen or fifteen. The first *hambeday* (religious fast or vision), came at about the same time, and was a period of solitary communion with the *Great Mystery*.

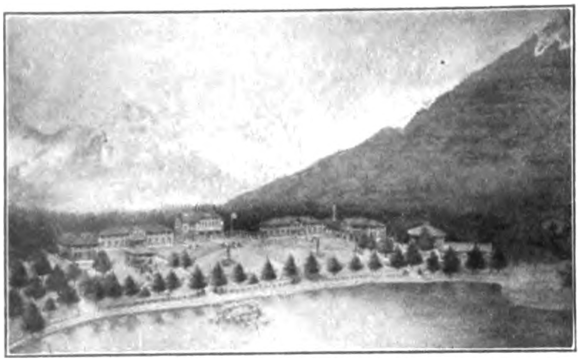
With the ancestral philosophy as a foundation, the Indian's out-of-door life made him a strong reasoner and an independent thinker. He was as ambitious to be a successful hunter as a warrior, since the good hunter is also a feast-maker and the social center of the tribe. Many of our most noted characters were of this type; men of peace, whose generosity and good will gained for them not only the favor of their own band, but intertribal distinction.

On the other hand, his sister was put through a course of training equally rigid in its way, according to our ideas of the womanly character and vocation. We Indians held firmly to the belief that purity and modesty are the foundations of womanly strength and of the sacredness of home. All her energies were subdued to this end. Free and sportive when with her girl companions, in the presence of man she became instantly mute, averting her face from him with child-like, yet maidenly, timidity and reserve. The use of the eyes was strictly inculcated by the careful mother, and the "straight eye," that guarded, yet straightforward look, was deemed an index to the purity of the maiden. There was, in the old days, no social gallantry or meeting of the young men and maidens, save in one or two formal dances. Even in these they did not take partners, the boys dancing on one side of the ring, and the girls opposite. It was a sort of Quaker gathering. The young girl must not joke or talk freely even with her own brothers, or with any man except her two grandfathers. When one came to ask her hand, she was not expected to reply at once, but to keep him on probation until satisfied that he was sincere and worthy an answer. She had sometimes a little teepee of her own within the parental lodge, and went nowhere without the protection of her grandmother, who was considered to be her natural guardian and supported the part with much dignity. Every year, from the age of twelve or fourteen, she joined in the virgins' feast, where all take their oath upon the "sacred stone" to their purity and innocence, vowing to remain chaste until their marriage. The whole tribe attended this feast as spectators, and if any girl was discovered or suspected to be untrue to her vow, she might be publicly disgraced.

From early childhood the "little woman," as she is called, worked side by side with mother and grandmother, helping or imitating her in beaver-like industry. Tanning and dressing skins, drying meat, making and pitching the skin teepees, fetching wood and water, cooking — these were her hardest tasks, to which she added the making and mending of the family clothing and moccasins, the gathering and drying of fruit, wild rice, and roots for winter use. All these the little girl "made believe" in her earliest play, and learned to achieve gradually, as strength and skill permitted. She usually became an adept in needlework, whose pride it was to see that her brothers and male kinsfolk were becomingly attired; nor were the poor and old people of the clan forgotten. While hunting, fishing, and war weapons were made by the men and boys, the women made everything else, including more or less fine pottery in many tribes, the weaving of rush mats and blankets of wool, basket-making of vegetable fiber, and canoe-making. All of these are decorated in symbolical designs, conventionalized from natural objects, such as hills, a serpent, lightning, leaves, and flowers, while the marvelous combinations of color are likewise adapted from nature with much of native artistry. The Indian girl, as well as her brother, was taught to repeat sacred stories and legends of old, especially those which have a feminine character. Even her lullabies spoke of the doe, the mink, and the ermine (to which woman is often compared in the language of compliment), or of the fairy sisters who lure the lone hunter to follow their musical laughter into the depths of the forest. Her dress was that of a miniature woman, a long, straight robe reaching nearly to the ankles, with wide flowing sleeves; and her home-made dolls were attired after the same unvarying fashion. Her long, black locks were dressed with perfumed oil, smoothly plaited and sometimes adorned with beads or shells to match her necklace, but the woman might not wear eagle feathers, unless rarely in a sacred dance. She must learn by practicing when alone how to laugh musically and gracefully, must sit sidewise in modest feminine fashion — never cross-legged like a man; and etiquette even prescribed a distinctive speech, many words being used only by women or having a feminine termination. The Indian girl could run, swim, and ride almost as well as her brother, and as she had much labor to perform, the woman was often quite as muscular as the man, and of heavier build. She was apt at woodcraft, and a close observer of bird and animal life, particularly of their home-making. She knew the plants and flowers better than he, since it fell to her to gather and preserve them for food or medicine.

Such was the practice and such the precepts by which we were prepared to bear an honorable part in the life of our people.

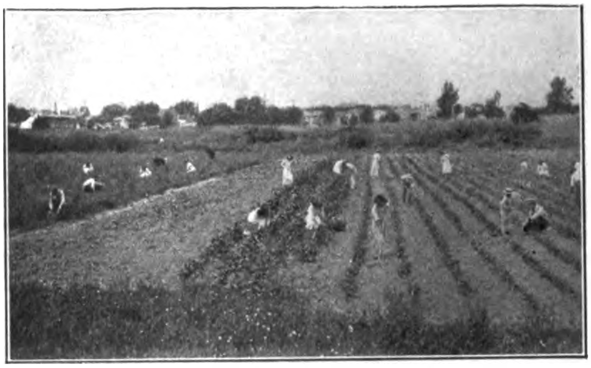
Present System of Education. — It is said that one of the early councils with the natives of Virginia was concluded by an offer on the part of the colonists to educate several of the children of the forest with their own sons. The Indians retired to deliberate upon the matter, after which they replied as follows: "We thank you for your generous offer. We have decided that the education of your schools will not benefit our children in the life that is ours, but we desire to convince you of our friendship for the white man. If you will entrust us with three or four of your most promising young men, we will charge ourselves with their edu-



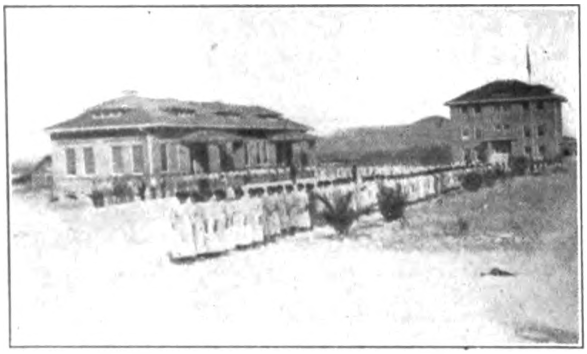
Sheldon Jackson Industrial School at Sitka, Alaska.

Graduating Class (1909), Carlisle Indian School.

Farming at the Carlisle Indian School.



Gardening at the Carlisle Indian School.



A Training School for Girls, Tucson, Arizona.

A School Band.

INDIAN EDUCATION.

cation, and we will *make men of them.*" The story illustrates, as well as may be, the complacent attitude of the conquering Anglo-Saxon, who has been satisfied from the beginning that his kind of education was not only best for himself but for his red brother as well, and that he was doing him the greatest favor within his power by forcing upon him the customs, philosophy, and religion of an alien race. On the other hand, it shows us the unlettered sage, firm in his original belief that his own ways were best for himself. He was not anxious to impose them upon others, but made his counter-proposal as the most courteous, and at the same time the most logical method of conveying his answer. The first American had not the least desire to copy or emulate his unbidden guest, whose vices and weaknesses provoked in him at least as much contempt as his brilliant achievements aroused wonder and admiration. This position he maintained with dignity in every instance until convinced that he was beaten, that he was no longer to be allowed to live his own life, and must learn the language, manners, and religion of his conquerors or be trampled under their feet. When this point was reached by an individual or a tribe, and not until then, he has voluntarily placed his children in school and set himself with determination to " walk the white man's road."

The evidences of his success in this difficult undertaking are so many and so varied, covering, as they do, a period of over three hundred years, that it is curious how long the popular fallacy has persisted that " the Indian cannot be civilized." The only excuse for such a view is to be found in the simple fact that the Indian did not in the main, or until he was pushed to the wall, desire to be "civilized," and in the further fact that until a very recent period no systematic or comprehensive efforts were made in that direction. Sporadic and individual efforts there have always been since the date of the very earliest settlements in America, which efforts have, from the beginning, met with enough success to prove — if proof were needed — that the natives of America are as capable of taking on an alien culture as were the wild Celts of adopting the manners and language of the conquering Saxons. Man is, after all, a progressive animal.

The earliest education of the natives of this country by its invaders may be said to have been the undesigned and inevitable alteration wrought by contact. Even without any conscious wish or intention on either side, a primitive people could not live in close touch with one more advanced, and not suffer a profound change. The Indian passed at once into the iron age. In every case, the first fruits of civilization were knives, firearms, and whisky. These tended toward destructive internicene wars, as they inflamed and brutalized his simplicity; and the next wave brought with it other dangerous and corrupting elements which he was as little formed to resist. Venereal disease and small-pox, scrofula and tuberculosis undermined his native vigor and decimated the tribes, or in some instances exterminated them altogether. The white man literally possessed nothing which the Indian wanted or needed, while practically all the possessions of the lords of the soil were coveted by the invader. He could not exist without them, and in order to secure them he created artificial desires which he could satisfy, but at frightful cost to his victim. Trade was at the first a mere farce, since the red man had no conception of material values, no taint of commercialism. He was generous and hospitable, willing to give of his abundance without return, and to accept pretty trifles with gratitude. Told that a string of blue beads were made from a piece of the sky, the credulous chief was ready to exchange for them all that he had! But after two or three generations of schooling in the tricks of trade, he became almost as sly and avaricious as his teacher, and in the same way he has come to be in many instances a " grafter " in politics and a hypocrite in religion. This process in its several stages, differing in detail but alike in its general features, has been in evidence in widely separated portions of the continent during the past three hundred years.

Those enthusiastic propagandists and able organizers, the Roman Catholic clergy, have been leaders in the designed and deliberate instruction of the natives, not only in religion, but in art and industry. Their courage and good intentions are worthy of all praise, however one be inclined to demur as to the benefit of imposing their system in its entirety upon a naturally reverent and superstitious people. They have commonly succeeded in grafting their ceremonials upon the " pagan " ritual, and by a free use of holy water and the sign of the cross have made more nominal converts than all other religious bodies put together. It should also be admitted that they have much that is tangible to show for their labors. As early as 1567 the agricultural education of the Indians in Florida was attempted by the Jesuits, and nearly two centuries later early Franciscan missions in California and other parts of the southwest achieved results mainly practical and social. Domestic animals and the agricultural arts were permanently acquired. The discipline of the fathers was rigid, and amounted to a benevolent servitude. In 1834 the missions were secularized by the Mexican government against the protests of the order, and their extensive property divided among the Indians, who soon lost or were deprived of it. Early French missions included those among the Abenaki in Maine, the Hurons in Ontario, Michigan, and Ohio, the Iroquois in New York, the Ottawa in Wisconsin and Michigan, the Illinois in the Middle West, and the tribes of Louisiana. Bishop Laval founded a school at Quebec for French and Indian youth. Other pioneer missionary work, extending into the nineteenth century, was conducted in the Missouri River region by Father Ravoux, Father De Smet, and other less noted explorer-priests, among Flatheads, Chippewas, and Sioux.

One of the avowed objects of colonizing Virginia, as stated in the early charters, was that of "bringing the infidels and savages to human civility!" The council of Jamestown in 1619 voted to educate Indian children in "religion, a civil course of life, and in some useful trade." A few were taken to England to be educated. In 1663 the colonists demanded children as hostages for the good behavior of the Potomucks, which hostages were to be "civilly treated and brought up in English literature." At about this time King James issued a letter authorizing collections to be taken in the cathedrals for "the education of the children of these Barbarians," and about fifteen thousand pounds was received. In 1621 the Company had allotted one thousand acres of land and received subscriptions to endow an Indian school, wherein the "most towardly Indian children" should be fitted for college. But an end was put to these early projects by a sudden uprising of the incensed natives to rid the land of the troublesome invaders; and although the larger part of the colonists owed their lives to the warnings of Christian Indians, no further efforts were made until the founding of William and Mary College in 1693. The charter of this institution declares one of its main objects to be "the propagation of the Christian faith amongst Western Indians." There was, apparently, some difficulty in obtaining pupils, one explanation of which is given by Governor Spotiswood, who writes to England: "They (the Indians) urged the breach of a former compact, when, instead of their children receiving the promised education, they were transported, as they say, to other countries and sold as slaves."

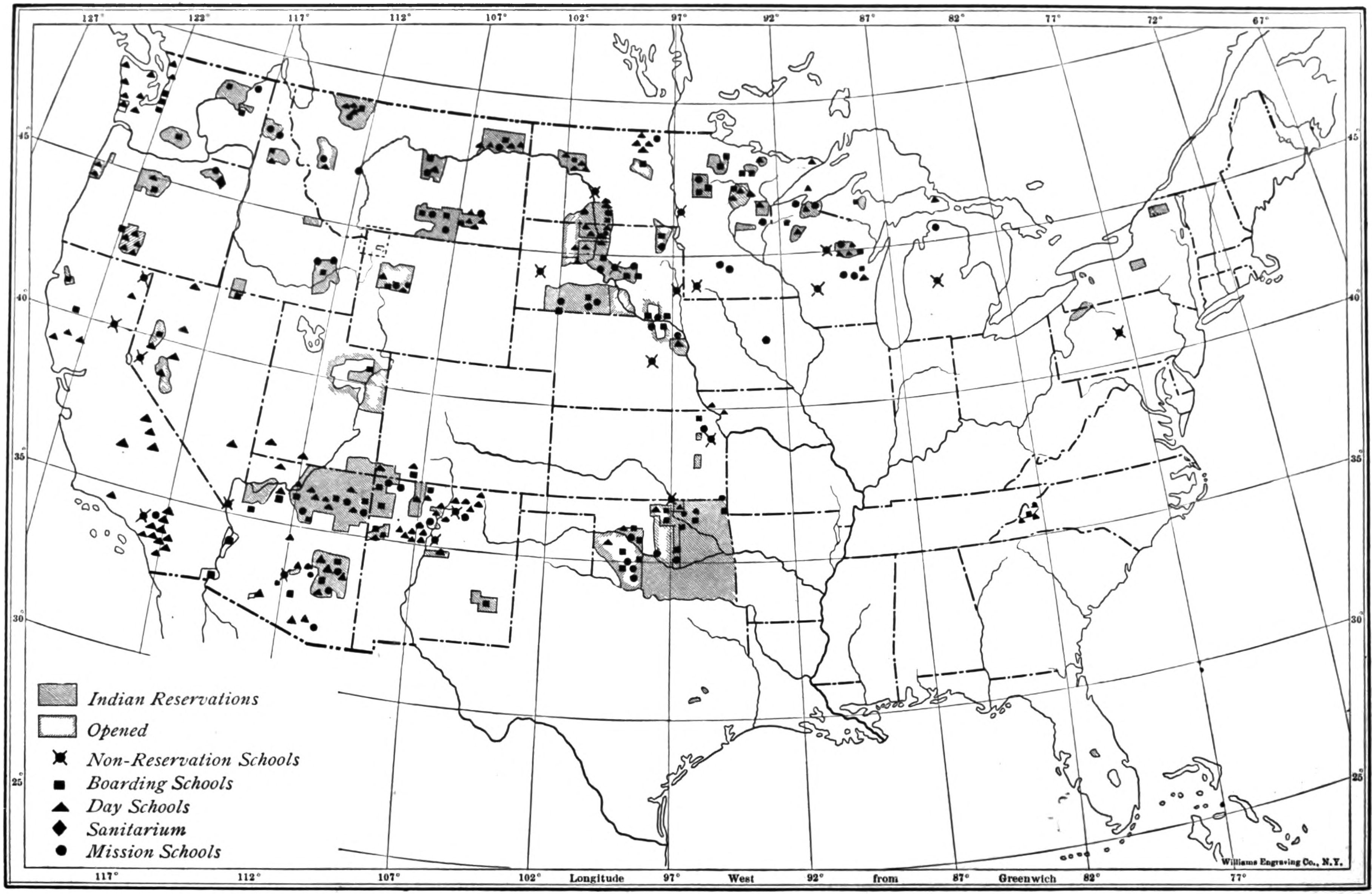
In Massachusetts the famous "Apostle to the Indians," John Eliot, who translated the Bible into the vernacular, labored with them in things secular as well as spiritual. He founded the Christian Indian town of Natick, laid out, built, and planted by Indian labor, and it was not his fault that the "Praying Indians" of Natick, who are said to have been thrifty and industrious as well as diligent church-goers, suffered cruelly from race prejudice during King Philip's War. Daniel Gookin was appointed Superintendent of Indians in the Massachusetts colony in 1656, and held the office until his death thirty years later. His duties included the conduct of schools among them, as well as the preservation of good order and discipline. These schools, however, were much hampered by lack of means and of suitable teachers, two difficulties which have largely persisted to this day. It was a part of the New England plan, as in Virginia, to give to selected youth a college education, to fit them for the Christian ministry, and to instruct their wilder brethren. The charter of Harvard College contains a provision for the education of Indians, and not a few availed themselves of it. But the sudden change to a sedentary and indoor life caused many to fall sick and die. One youth who was about to be graduated, "a good student and pious man," says Gookin, was shipwrecked and drowned off Nantucket, and another who had taken his degree died soon after "of a consumption." A third student at twenty years of age is said to have been "an extraordinary Latin poet and a good Greek one."

At about the middle of the eighteenth century, an industrial boarding-school was established at Stockbridge, Mass., and the missionary at that place wrote of them: "There are many Indian youth that read English well." Several of these completed their studies afterward at Dartmouth College, which was founded in 1755 as "Moor's Indian Charity School." The school originated with the Reverend Eleazar Wheelock of Lebanon, Conn., who took into his own family a Mohegan by the name of Samson Occum. The youth proved an apt pupil, and became a Christian preacher of much force and distinction. He was sent to England to raise funds for the school, after it had been incorporated as a college and removed to New Hampshire, and was highly successful in this, being a most interesting speaker. He also wrote a number of striking hymns, one of which is sung in the churches to this day. At Dartmouth, Indian and white youths were educated together, many of the latter being trained for missionary work among Indians. The gifted and friendly chief of the Six Nations, Joseph Brant, who was brother-in-law to Sir William Johnson, was one of its early scholars, and afterward sent two of his sons there.

The Moravian missions in Pennsylvania were very successful, and the story of the sad exile of the converts from their prosperous villages and the brutal massacre of ninety innocent and unresisting Christian Indians in 1781 is one of the blackest chapters in history.

There were Russian and English schools for the natives established in Alaska in the latter part of the eighteenth century. In the Canadian colonies much pioneer work was done by Roman Catholic missions, but it was not until 1867 that the provincial government took up the work systematically. In 1904 there were in Canada 24 industrial, 46 boarding, and 228 day schools in operation. The natives of the Dominion are for the most part law-abiding, prosperous, and contented, having proved neither a menace nor a burden to the commonwealth.

The first appropriation by the United States government for Indian education was the sum of


▨ Indian Reservations
☐ Opened
Non-Reservation Schools
■ Boarding Schools
▲ Day Schools
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Williams Engraving Co., N.Y.

INDIAN EDUCATIONAL INSTITUTIONS.

five hundred dollars voted to Dartmouth College in 1775. Cornplanter, speaking for the Senecas, appealed to General Washington in 1776 for a teacher, " to teach our children to read and write and our women to spin and weave," and agreed to send nine Seneca boys " to be under your care, and learn to become wise and good men." The first general appropriation of $10,000 was made in 1819, and until 1870 all government aid for this purpose passed through the hands of missionaries of various denominations. Afterward, for nearly thirty years, government schools and church schools aided by government funds existed side by side, until in 1900 these " contract schools" were abolished, the religious societies assumed the care and support of their own schools, and the annual Congressional appropriation is applied under the law entirely to schools conducted by the government. The original $10,000 had gradually increased by 1870 to over $100,000; but it should be remembered that this appropriation, which has now grown to several millions annually, is in large part the Indians' own money, being interest on trust funds or made in fulfillment of treaty stipulations, "for value received." It is not disbursed as charity, but as partial payment on an enormous debt. By this time, also, there were constant appeals and demands from the Indians for the establishment of new schools, and the further development of those already in existence.

In 1878 seventeen prisoners of war from St. Augustine, Fla., were admitted to Hampton Institute, Va. (*q.v.*), at their own earnest desire and the generosity of its large-hearted founder, General Armstrong (*q.v.*), who soon sent to Dakota Territory for fifty wild Sioux, and added an Indian Department. This experiment was followed the next year by the establishment of a school of similar character, for Indians only, in the abandoned military barracks near Carlisle, Pa., by General R. H. Pratt, who built up at that place the largest, most famous, and in many ways the most successful Indian school in the country. About one thousand pupils at Carlisle and one hundred at Hampton are given a grammar-school education, with a little normal or business training, one half of their time being devoted to agriculture, domestic work, or one of the mechanical trades, taught both for its educational and practical value. Through the " Outing System," originated by General Pratt and since extended to some western schools and reservations, boys and girls are placed in selected farmers' families to work for their board and attend the public school, or during the summer to work for wages, thus learning effectively by association and example.

The eastern or " non-reservation schools," now twenty-six in number and scattered widely over the country, have probably accomplished as much in the way of educating public sentiment and furnishing inspiration and example as in more direct results. Carlisle's brilliant record in athletics, its football team having met and defeated the teams of some of our leading universities, has done much to attract popular attention to the "educated Indian." The excellent bands of some of the larger schools are likewise a widely popular feature. The great majority of their students, even though not graduates, become self-supporting and self-respecting citizens, cultivating their allotments, making decent homes, or filling responsible positions in the Indian Service, while an ever-increasing minority compete successfully in the various trades and professions in white communities. Of those who fail it should be said that much more is expected of them than is at all reasonable, in view of their meager training, often covering only three to five years, their frequent lack of physical vigor, and the general stagnation of their home surroundings.

Reservation boarding and day schools were first established by the government in 1873. The courses in these are elementary, and in all of the boarding schools the industrial feature has been made prominent, but has only gradually been introduced into the day schools. The evils of appointments made under the political " spoils system" have greatly handicapped the service, these evils having been reduced, but not entirely eliminated, by placing most positions under civil service rules. It is chiefly because of a higher personnel and greater continuity in the service that a comparison between mission and government schools has been generally, though not always, to the disadvantage of the latter. Some of the smaller schools, especially day schools, hampered by poor equipment, inefficient teachers, and a discouraging environment, were by many thought to be almost useless. During the last few years, however, there has been some change in local conditions and a decided change in the official attitude in this regard, and a recent Commissioner of Indian Affairs has recommended the gradual abolition of the non-reservation schools and the development of the simpler and less expensive day-school system, as better adapted to the present needs of the people. The last report of Indian schools gives 343 schools, including mission, with a total enrollment of nearly forty thousand pupils, and involving an annual expenditure of five million dollars. These figures do not include the New York Indians, who are under state control. Eleven thousand Indian children are admitted into the district schools.

A Superintendent of Indian Schools was appointed in 1882, and a force of traveling supervisors some years later. The first supervisor in the field, in 1890, was a woman, and the most practical and successful Superintendent, holding the office for some ten years, was also a woman, Miss Estelle Reel of Wyoming. Each year there are graduates who pass on into higher institutions, such as art, normal, or nurse's training schools, academies and colleges, so that we have now a considerable number of native teachers and preachers, and some lawyers, dentists, and physicians. A few have succeeded as authors, artists, and lecturers, and we have representatives of our blood in both houses of the national legislature. The results of a generation or two of systematic work are immeasurable, and the best evidence of the Indian's capacity and progressiveness is the list of those who have won recognition and a livelihood in the most exacting and most arduous pursuits of modern life. C. A. E.

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INDICULUS UNIVERSALIS. — A nomenclator or dictionary of the names of *things*, compiled by the Jesuit, Francis Pomey, similar in its inclusiveness to the *Janua Linguarum* of Comenius, excepting that usually there is not the same amount of descriptive matter that there is in Comenius, *i.e.* Pomey's book remains strictly a nomenclator. Pomey (1619–1673) became a Jesuit in 1636, and was a teacher in various schools and chiefly at Lyons. He wrote many books, particularly a large French and Latin dictionary, and a small one (*Flos Latinitatis*), a *Pantheum mythicum* (1659), a rhetoric, and *Colloquia scholastica* (1668). The *Indiculus Universalis* (in French and Latin) was published at Lyons in 1667. It went through many editions, and has been issued in several languages, *e.g.* Italian, Spanish, German, Dutch, and English. (See Backer, *Bibliothèque de la Compagnie de Jésus* (1895), Vol. VI, p. 989). An English edition by A. Lovell, M.A., appeared in 1679. F. W.

INDIFFERENCE. — See Attention; Interest; School Management.

INDIFFERENCE POINT. — There are certain experiences which are neutral with reference to their feeling tone, giving neither pleasure nor displeasure. These are said to be at the indifference zone or point. A simple illustration of this fact can be given by observing the transition which takes place in feeling tone when one passes from warm temperature sensations to cold. Between warmth and cold there is a central point at which no pleasure or its opposite is experienced. C. H. J.

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INDIRECT METHOD. — See Direct Method.

INDIRECT VISION. — The field of vision is large, and includes not only those objects which are in the center of clear vision, but also objects which lie around these objects which are most clearly seen. The importance of the field of indirect vision for the individual is that he receives from this indirect field warning of objects that are moving toward the center of the field. However, because of the obscure character of the objects in the indirect field, the individual is not burdened by attention to these indirect objects. He can concentrate attention and experience upon the small number of objects at the center of clearest vision. The structure of the retina is different in the outlying regions. It is more sensitive in these outer regions to differences of light and shadow, and consequently reports all differences in movement of objects; while at the center of vision it is more sensitive to color differences. C. H. J.

See Eye.

INDIVIDUAL. — See Self; Personality.

INDIVIDUAL DIFFERENCES. — Every individual has characteristics which differentiate him from every other member of his race. The biologists have long recognized the importance of individual differences. They commonly use the term " variation " to indicate these departures of individuals from the racial type. When the variations are marked, the term "mutation" is sometimes used to designate the distinguishing characteristic. The two biological terms " variation " and " mutation " are sometimes employed in describing human characteristics. The term " individual differences " is used more commonly to call attention to the fact that along lines which the biologist would neglect there are characteristic differences that are of importance to the educator and to the student of sociology and psychology. Thus the appearance of a very tall or a very short individual would be of importance to the student of physiology and biology, but it would be of relatively small importance to the student of psychology. The appearance of a black-haired family in a light-haired stock would be another important event for the consideration of the biologist, but these physical characteristics are of no great importance to the educator. On the other hand, when an individual appears who is notably deficient or notably strong in his ability to work out number combinations, or to develop skill in one of the arts, we have a type of variation which is of great significance to the educator. These differences may be described as mental variations or mutations. Indeed, it may be said that in mental life we have a sphere of most plastic adaptation and readjustment. The nervous system has been described as the organ of variation, and consciousness has been described as the sphere of readjustment. When animal forms reach the stage of complexity in which structural readjustment is difficult or well-nigh impossible, the readjustment in function which appears through the use of powers in a great variety of ways takes the place in a measure of the earlier variations in structure which are of prime importance in biology and physiology.

An important question for the student of education is the extent to which individual variations may be affected through educational agencies. The students of heredity have made it clear in recent investigations that there are marked individual differences in ability at the beginning of individual life. The question now arises whether the individual differences which arise from hereditary endowments may be emphasized or overcome through educational practice. There are two schools of thinkers, one of which emphasizes the fundamental hereditary endowments and lays very little stress upon the modifications which can be produced through education. The popular mind, on the other hand, is impressed with the possibilities of modifying the hereditary endowments through educational activities.

The answer to this question has yet to be worked out with the aid of such methods as are described under the topic Tests (*q.v.*). See also Ability; Evolution; Heredity. C. H. J.

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INDIVIDUAL PSYCHOLOGY. — That branch of psychology which deals with the characteristics that distinguish one individual from another. Much attention has been given to differences in individual imagery. (See Eye and Ear Mindedness and Memory.) There are undoubtedly differences in individual inheritance. (See Heredity.) The importance of these individual differences is great in educational practice, as indicated in the adoption of the elective system (*q.v.*) as distinguished from the required course. The whole problem of grading (*q.v.*) is related to this matter of individual differences.

See Ability, General and Special; Adolescence; Child Study; Psychology; also Grading and Promotion.

INDIVIDUAL READING. — In the teaching of reading in the elementary schools, the traditional practice in assigning lessons is to require the same work of all members of the class. More recent practice separates the class into several groups to each of which a different assignment is made. This is done to give the child an increased interest in preparing his work at home and reading it aloud to his fellow pupils at school. Under this method the child knows that most of the class will be hearing unfamiliar material, the meaning of which he must make clear to them. Such a method likewise increases the attention of the class, doing away with the listlessness which characterizes children who are compelled to listen to a selection which they themselves have prepared and with which they are thoroughly familiar. H. S.

See Reading, Teaching of.

INDIVIDUAL TEACHING. — Any device by which the school program or other organization of classroom instruction allows of increased attention to the special needs of individuals is termed a method of individual teaching. Where the individual adaptation is attained through the teaching of small groups, it is more properly called "group" instruction. Hence the term "individual" teaching more strictly applies to that instruction which attempts to meet the needs of a single child at a time. Such particular care by the teacher may extend from that momentary attention to a pupil which is incidental in class instruction to the use of a supplementary teacher whose chief function is to teach children who require prolonged personal attention. H. S.

See Group Instruction; School Management.

INDIVIDUALITY. — The idea and fact of individuality are among the most familiar and best known things in experience. They are also among the most difficult to describe and define. Individuality is such a fundamental matter that it can hardly be defined without presupposing itself or giving a purely verbal equivalent, such as the unique, the distinctive to the point of the irreplaceable. An indication of its meaning is given by its logical usage, where it always implies contrast with a kind, sort, or *class.* This implied contrast also gives an indication of the place where the conception of individuality is important for educational philosophy. School administration and instruction require a certain uniformity of rule and method; these in turn presuppose sameness of character in those dealt with. In so far individuals are regarded as members, specimens of a class, distinguished from one another by purely external and physical traits. Since, as a matter of fact, there are intrinsic mental and moral differences, the purely uniform, or class, standpoint leaves out of consideration conditions that cannot safely be ignored. The idea of individuality serves as a reminder of these outstanding conditions. It calls attention to those traits which are unique, non-repeatable, which are differential, and which accordingly require special treatment, particular readaptation of general or class methods and standards.

History shows a continual, even if irregular, movement toward individuation; the recognition of the increasing importance of individually distinctive traits. In savage societies, the individual is also lost in the group — in the clan or tribe. Not till a comparatively recent point of historic development do we find individuals possessing rights on their own account in contradistinction from their status as members of a family, guild, class, caste, etc. Their rise from submergence in a class is a part of the growth of democracy as a social principle. From the scientific side, the appearance of the doctrine of evolution has emphasized the importance of individual differences and variations, as against the older notion of the fixed species within which the individual was placed and which exhausted his important or essential nature.

One of the most fundamental of all philosophic cleavages centers in the question of the method of valuing the facts of individuality. Professor James has divided philosophies into those which tend to assume the priority of the whole and to derive the individuals from the whole as its constituent parts or specimen instances; and those which assume the priority of the parts, the individuals, and make the whole secondary, dependent upon the arrangements reached among the individuals. The former philosophies approximate monism in substance and rationalism in method, the latter are pluralistic and empirical. The prominence of the concept of the organic in nineteenth-century idealism is owing to the fact that it seemed to yield a conception for reconciling the otherwise opposed ideas of individual and universal, whole and part. It may be questioned, however, whether the notion of the organic is a solution or only a peculiarly vivid presentation of the terms of the problem. The proper method of dealing with the question is probably suggested by the connection that exists between the common, generic, or class-universal and the facts of stability, order, conservation on one hand, and between individuality and variability, freedom, progress on the other. In a static and finished world, individuality would have no meaning; while a world lacking in universal characters, in characters that make things capable of reduction to classes, would not present any signs of law, permanence, and conservation. For the further educational significance of the term, see EDUCATION; and PHILOSOPHY OF EDUCATION.

J. D.

INDO-CHINA. — See FRENCH COLONIES, EDUCATION IN.

INDUCTION AND DEDUCTION. — There are two complementary movements of thinking involved in directing inquiry to a well-grounded conclusion. When a perplexity occurs or a problem presents itself, the first step is to clarify the obscure situation. This consists in such analysis of the situation as indicates a principle, law, or relation. Induction always terminates in an idea or proposition which is general because a statement of a relation, a universal. Deduction is the application of the generic factor to the interpretation, explanation, and organization of specific data. The two movements are complementary because induction terminates in the universal with which deduction sets out, while the validity and scope of the universal is determined by its application, under test conditions, to new facts — this application being deduction.

In Aristotelian logic, syllogism and demonstration correspond to what is now called deduction. The term which was translated into Latin as *deductio* designated simply the method of *reductio ad absurdum*, or the indirect proof of a proposition by showing that its contradictory proposition involved a logical absurdity or self-contradiction. Induction was a method of collecting instances or particular cases, and was perfect when all cases agreed, and formed, therefore, a class as it was imperfect when a number of cases (not all) agreed, so that the most that could be said was that some S is P, or that usually S is P. Perfect induction was known as induction by simple enumeration. After the rise of modern methods of induction, many logicians denied that the method of enumeration was a true case of reasoning, on the ground that it merely summed up in a single statement what was already known, instead of discovering any new truth.

In the sixteenth and seventeenth centuries attacks upon syllogistic logic because of its barrenness and verbal character were widespread. Interest centered in a logic that could be employed to wrest nature's secrets from her, while the syllogism was fitted, as Bacon said, only for argumentation. Agreed in their opposition to the old organon of thought, the new logicians at once divided among themselves. Some, Descartes and his followers, sought the new method in a new type of deduction; others, the British empiricists, in a new form of induction. According to the former school, we should begin by making a *tabula rasa* of all traditional beliefs, and seek for some concepts that are so inherently clear and certain that their meaning cannot be disputed nor their truth doubted. From these most general truths, by combination, further truths were to be established, proceeding by graded steps, so that at no time should any new factor be introduced which was not clearly defined and certain. In this way, reason was to proceed until reaching particular phenomena or concrete events, in space and time. These deduced phenomena would be approximated by actual sensible phenomena, and would constitute the rationality or explanation of the latter. Descartes even went so far as to offer a system of (to him) self-evident first principles, from which, given an original chaotic state of nature, the whole existing order of the world might be rationally deduced. Stated in the above fashion, the method appears as formal and as fruitless as ever the syllogistic logic had been; but, as matter of content, the whole scheme was conceived in mathematical terms. In effect it was a plea for the application of mathematics to nature. Toward the development of a mathematical science of nature, Descartes himself took the first step by his invention of analytic geometry. And for succeeding men of science — however it may have been with philosophers — deduction has meant mathematical procedure, which, entering upon a brilliant career, became a chief tool of scientific exploration and formulation.

Francis Bacon is popularly reckoned the father of modern induction — an attribution for which Macaulay is probably largely responsible. As a matter of fact, while he made much of induction, the method he proffered under that name is a confused mixture of the older method of cataloguing and the newer method of analysis. Sir Isaac Newton was both the practitioner and the formulator of induction proper, Locke's influence on the philosophic side blending with Newton's. According to Newton, the beginning must always be made with observations; these observations by analogy suggest some force or principle, known on other grounds to exist in nature, though not previously known to be concerned in the phenomena in question. This principle is then to be treated deductively, or mathematically, and thereby phenomena predicted which have not been previously observed, but which must be found if the theory is true. Further observation must then be resorted to to see whether the indicated phenomena do exist. If the actual phenomena agreed precisely with the deduced phenomena, the theory should be accepted until contrary evidence is discovered. So consistent was Newton in his demand for precise corroboration that when the observed astronomical data did not exactly agree with the results he calculated on the basis of his theory, he held the theory of gravitation in suspense until new data enabled him to revise his calculations. For a time the Newtonian and the Cartesian theories of the constitution of the solar system were rivals, but as the immense superiorities of Newton's explanation became more and more evident, the inductive-observational method was as firmly established in the natural sciences of facts, as the deductive in the mathematical.

No important developments in the theory of induction took place after Newton's time until toward the middle of the nineteenth century, when suggestions by Whewell and Herschel were taken up by John Stuart Mill, whose Principles of Logic is almost as classic a statement of an empirical inductive logic, as Aristotle's had been of a syllogistic logic. According to Mill, we reason or infer, originally, from particular to particular, from one case to another. This is due to an inherent propensity to generalize, or to assume that what happens in one case will also happen in other cases. The sole scientific warrant for this belief is the uniformity of nature, which is itself an induction from a vast, literally countless, number of particular observations, where not a single contrary or negating instance is found. This widest of all inductions is, then, the logical ground upon which all other inductions rest.

In the development of his system Mill alternates between two different definitions and treatments of induction, one conventional and rather sterile, the other based on the actual procedure of experimental science. According to the former, induction is the process of inferring that what has been observed to happen in a certain number of observed cases will always happen in cases resembling them. Evidently such a statement is vague. It raises the questions: How great must the number of observed cases be? What is it that really happens in the original cases — no easy matter to determine because of the complexity of natural events. Just what degree of resemblance must exist to warrant belief in the same thing happening in other cases? And how shall we make sure that the required kind of similarity exists? In dealing with such questions, Mill passed over to the idea that the crux of induction is found in the various methods that analyze the observed cases and bring to light within them some unvarying coexistence or sequence of elements. Induction is thus the method of finding *in* the phenomena some relation which is not directly observable.

Mill never clearly apprehended, however, the transformation which he himself effected in the notion of induction. According to his first and official views, induction simply extends to all cases what is found in some cases. According to the later, his *working*, though not professed, view, it consists in finding out what *really* happens or exists in " some cases." The emphasis has shifted from the mere quantitative collection and mechanical comparison of instances to the qualitative and experimental analysis of the one typical case, or to the few carefully selected cases. Empirical collection of a great number of cases remains indeed of great importance, but as an assistance and safeguard in the selection and analysis of a typical case and in testing the resulting hypothesis, not as furnishing the original premises of an inductive inference.

Educational methods have reflected and have suffered from the divorce of the deductive and inductive phases of reflective inquiry characteristic of the history of logic. The chief error upon the side of the inductive movement is in supposing that the mind begins with a lot of separate, independent objects, such as this, that, and the other river, and then proceeds by mechanical comparison to select the things they statically have in common, and to reject the qualities not found in them all. As a matter of fact, induction consists in grasping what is *significant*, what is intellectually important, in any one river. Comparison and contrast with other rivers is of value, not in pointing out external likenesses and differences, but in helping to weigh the relative importance of qualities, and to seize upon and to emphasize any property that gives a clew to understanding other features. The trait of generalization found in induction does not primarily have to do with what is common to a number of cases, but with the *law or relation* which is significant in *any* case.

Educationally this means, that it is important to deal with a *single* river basin as a typical case, so as to get an idea of what is important in it, rather than to deal superficially with a large number of river systems. Moreover, the *importance* of any feature means its power to explain other features. Hence what should be emphasized in inductive study is the *causal*, the productive or dynamic factors. These can best be brought out by a thorough study of a river system treated as a type, while comparing a large number of cases without careful analysis of any one case brings into relief only static properties, effects, not causes.

It will be noted that when the inductive method of instruction takes as its object the discovery of causal or explanatory features, it is organically connected with deduction, since the motive of discovering these basic features is to get a principle which may be applied to interpreting and organizing the other facts characteristic of rivers. This application is deductive. On the other hand, the mere selection of properties common to a number of objects throws no light upon *why* they are common, nor does it help explain the traits which, being dissimilar, are eliminated. Hence induction is arbitrarily separated from deduction.

Other errors in the method of instruction due to this mechanical division of induction and deduction are the following: (1) Teaching any subject so that isolated facts are amassed, without using them so that there is gained a view of some inclusive situation in which the different clews are connected and hence significant. (2) Or, when the weakness of this method is perceived, the teacher is content to leave the pupils with only a vague notion of the whole to which the details belong. This vagueness can be expelled (and the special facts made really significant) only as the mind realizes *how* the particulars go together to make up the inclusive whole.

It goes without saying that when induction is isolated from deduction, the latter must also be isolated and hence fail to exercise its proper function. Educational errors of method flowing from this isolation are the following: (1) Beginning with definitions, rules, principles, laws. It may sometimes be pedagogically advisable to *present* a definition or law at the outset, especially with older students, but in all cases it should be recognized that this is a psychological device for directing attention to a *problem*, not a statement of a true logical principle. Logically, the general principle or law has no meaning until in the course of dealing with some individual complex situation need has arisen for explaining various particulars by binding them together into a more coherent system (2) Even when the explanatory principle has been properly reached, there may be failure in the proper use of deduction through not securing its *application* to *new* cases. It is at this point, not at the outset, that the reference to a number of cases becomes most important. When, by a study of a type case, the pupil has become possessed of its principle, or generic nature, this principle must be expanded, clinched, and tested by application to a variety of other cases not previously studied. So far as possible this application should involve not only new observations, but also a factor of experimentation (*q.v.*). Mathematics, primarily a deductive study, suffers particularly in education from lack of application of its general principles to concrete empirical situation. The application of a mathematical conception simply to other mathematical cases, however adequate in abstract theory, is, pedagogically, simply an elaboration of the principle, not a deductive testing of its meaning.

The prior discussion may be summed up by saying that educational method has lagged behind the development of scientific method. It has tended to remain at the plane of the earlier scientific practices in which induction as dealing with particulars, and deduction as dealing with universals, were separated from each other. Educational method should adapt itself to the change in scientific method, in accord with which reflective inquiry is concerned with complex objects and situations, in which induction serves to discover, by analysis, a relation or principle, while deduction employs that principle synthetically to reconnect particulars into a more comprehensive situation or object.

J. D.

See Abstraction; Analysis and Synthesis; Conception; Generalization; Hypothesis; Knowledge; Method.

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INDUCTIVE GEOMETRY. — See Inventional Geometry.

INDUSTRIAL ART. — See MANUAL TRAINING; DESIGN; ART IN EDUCATION; ART IN THE SCHOOLS; ART SCHOOLS.

INDUSTRIAL ART SCHOOLS. — A type of schools uniting many of the features of art schools and of industrial or technical schools. (For detailed discussion of principles underlying the work of these schools, see articles on ART SCHOOLS; ART IN SCHOOLS; DESIGN; DRAWING; INDUSTRIAL EDUCATION.) Instruction in drawing and design forms the basis of the work. Specialized instruction is given along one or more of the following lines: ceramics, designing for special industries, jewelry work, costume designing, decoration, bookbinding, illustration, metal work, etc. These schools form an important part of the educational system in many European countries, notably in Austria, Germany, Switzerland, Great Britain, and France. In Great Britain such schools have been fostered by the national government, which, aroused by the International Exposition held in London in 1851, realized that the country must have well trained designers and craftsmen if its commerce was to be maintained in competition with the artists of foreign workshops. In London, besides the large central industrial art schools, there are numerous local centers under the direction of the County Council and many schools conducted under private auspices.

In the United States, industrial art schools were not developed until after the Philadelphia Centennial Exposition of 1876, when several were established within a few years. The School of Industrial Art of the Pennsylvania Museum was an immediate outgrowth of the Exposition, and to-day is the most important school in the United States devoted entirely to the industrial arts. It is divided into two separate branches — the School of Applied Art, where the enrollment in 1911–1912 was 834, and the Textile School, with 250 students. The Rhode Island School of Design, at Providence, makes a specialty of jewelry and silversmithing, as these are some of the chief industries of the locality. For the same reason the School of Industrial Arts at Trenton concentrates on china and pottery, the principal local industry.

The H. Sophie Newcomb Memorial College of Tulane University, New Orleans, was established in 1887, and has been the pioneer in the South. A pottery was erected in 1901, and Newcomb ware has a recognized artistic and commercial standing. In Cincinnati the Ohio Mechanics' Institute, although established as early as 1828, did not have a day department until 1899. New buildings have recently been erected, and the industrial museum is being developed along art lines, the aim being to make industrial art the special feature of the Institute.

The public schools throughout the United States are developing courses in industrial arts both in the elementary and secondary schools in the belief that this will provide a means for intelligent selection of a vocation and aid in creating an appreciative public. The demand for competent teachers of the industrial arts, particularly for secondary schools, is in excess of the supply. The most important of the normal schools having industrial art courses are Teachers College, Columbia University, New York; Pratt Institute, Brooklyn, N.Y.; and the Normal School of Manual Arts at Santa Barbara, Cal.

The following are the most important industrial art schools in the United States: New York State College of Ceramics, Alfred, N.Y.; Maryland School of Art and Design, Baltimore, Md.; Ohio Mechanics Institute, Cincinnati, Ohio; James Milliken University (pottery and metal work), Decatur, Ill.; Evening Drawing School (five years' course for jewelers and silversmiths), Newark, N.J.; Newcomb Memorial College, Tulane University, New Orleans, La. (pottery, embroidery); School of Industrial Arts, Teachers College, Columbia University, New York, N.Y.; New York School of Fine and Applied Art (costume illustration, jewelry, commercial design), New York, N.Y.; Pratt Institute (jewelry, metal work, etc.), Brooklyn, N.Y.; Bradley Polytechnic Institute (metal, wood work, and horology), Peoria, Ill.; School of Industrial Art of the Pennsylvania Museum, Philadelphia, Pa.; Rhode Island School of Design (jewelry and metal work), Providence, R.I.; School of Industrial Arts (pottery), Trenton, N.J.; School of Ceramics of the University of Illinois, Urbana, Ill.

F. N. L.

See ART; ART SCHOOLS; ART IN SCHOOLS; DESIGN IN DRAWING; INDUSTRIAL EDUCATION.

INDUSTRIAL DAY SCHOOLS. — See INDUSTRIAL EDUCATION.

INDUSTRIAL EDUCATION. — General Outline. — The term "industrial education" may be used in a very comprehensive sense or in a more restricted meaning. In a large way the term includes all education relating to the industries, and in this sense would include instruction in industrial arts in the elementary school, trade and technical instruction designed for the industrial worker, and the professional education of the engineering schools. In common usage, however, the term has come to be used in a more limited fashion as denoting the field of vocational education aimed to meet the needs of the manual worker in the trades and industries, and in this sense is used in the following article. In this conception industrial education has to do with the secondary field beyond the point at which boys and girls leave the elementary school and below that of the college. (See MANUAL TRAINING for the former, and TECHNICAL EDUCATION for the latter.)

The need for industrial education, as far as it is a matter of schools, has arisen since the industrial revolution of the eighteenth century, which introduced the factory system as the universal type of modern industrial organization. During the four or five centuries when the handicraft system of small masters and establishments was the prevailing basis of production, the matter of industrial training was met in a simple, and on the whole, a competent manner within the conduct and organization of trade procedure. (See APPRENTICESHIP EDUCATION; GILD, MEDIEVAL, AND EDUCATION.)

It is true that the gild records of England and the Continental countries disclose many items indicating frequent attempts on the part of masters to take advantage of apprentices through failure to provide competent instruction in their craft, as well as to furnish proper food and findings; and the repeated occurrence of regulations as to fines and other penalties aimed at such abuses, shows very clearly that such conditions were not uncommon. It is also unquestionably true that, particularly in those countries where the period of apprenticeship was of considerable length, as in England and in many trades in France, a large amount of time was consumed in menial tasks of little industrial value to the young worker. On the whole, however, the handicraft system under gild supervision, as trades were then practiced, undoubtedly made for a fairly effective system of industrial training, and this particularly because of three elements inherent in the situation, all of which have disappeared under present conditions. (1) It was distinctly to the master's immediate advantage, with his small staff of workers, which permitted of very little division of labor, to give his apprentice a thorough training in order that he might reap a full labor return during the period of the indenture. (2) The master, being not only employer and merchant, but chief craftsman, working side by side with his assistants, was free to give instruction at such times and in such directions as he saw fit. (3) The fact that the apprentice in the regular order of things expected in a few years to become himself a master must have stimulated his ambition to obtain as broad a knowledge of his craft as possible.

The influence of the factory system upon this situation was not only that division of labor, constantly extended, no longer allowed the learner, if employed to the greatest economic advantage, to obtain a broad experience in all branches of a craft, but, even more important, that the entire relation between employer and learner was changed. The master craftsman, no longer taking direct part in the processes of production, became the capitalist employer, whose first concern is the development of highest immediate productive efficiency. The learner, on the other hand, entering into such an organization, faces for the most part a wage earning career in which his place will be determined not alone by his abilities and ambitions, but by the particular opportunities afforded him for breadth of experience and for comprehension of these experiences. In such a situation it has ceased to be the immediate interest of the employer to bestow more attention upon the learner than will suffice to make him most rapidly into a productive unit at some process in the range of the establishment. Still less is there economic incentive for the wage earning worker in a commercial establishment to give time and effort to extend the training of the learner. Productive efficiency is the sole aim of the modern organization of industry. For this purpose it is a highly adapted instrument, but education lies outside of this purpose. These latter considerations operate so powerfully upon the case that even in trades representing very little division of labor, the value of apprenticeship training has often fallen to a very low point.

To sum up the situation presented by modern industrial conditions in this connection, it should be noted, first, that grades of skill and the extent to which division of labor is carried vary greatly in different industries. Second, that the typical manufacturing industries employ a large number of workers of low-grade skill, requiring little initial instruction or experience to adapt themselves to their tasks, which often involve only a narrow range of machine operations, and a smaller number of highly skilled workers demanding breadth of experience and trained intelligence for their equipment. Third, that the economic interest of the employer is mainly concerned with the supply of the latter class, and that any measures undertaken by him to train such a class are necessarily based on the prospect of future return and not of immediate profit. Fourth, that such training on the part of the employer involves labor in addition to the purely productive work of an industrial organization, and for that reason an additional element of expense. This element of expense and the extreme mobility of labor under modern conditions, which leave no guarantee to the employer that the learner will remain in his employ after receiving a training, constitute the chief obstacles to the development of adequate measures of industrial training within commercial establishments. To these obstacles is added the fact that, besides skill of hand, modern industry requires in its expert workers increasing knowledge of mathematics, science, drawing, and technical matters in order to insure proper comprehension of new methods and new forces, and for instruction in these branches the organization and personnel of an industrial establishment is not well adapted.

These conditions, in which modern industry finds the task of competently training high-grade workers within its own organization difficult, expensive, and not assuredly profitable, have brought forward the demand for an outside agency, viz. the school, to assist in the task. The problem thus presented of supplying the deficiencies of training under commercial conditions, and of supplementing this training by additional instruction, is evidently one that must find its solution in particular and varied measures adapted to the needs prescribed by different localities and different industries. From the nature of the case there can be no general solution, but only a multitude of particular solutions.

The precise ends, then, placed before industrial education looked at from this purely economic aspect, are to supply either breadth of practical experience along particular lines, or knowledge leading to the comprehension of technical practice, or both, to youth having opportunities or ambitions to fit themselves as high-grade workers.

To this problem the leading countries of Western Europe have addressed themselves with increasing seriousness for something over half a century, and in the United States conviction as to its importance has been rapidly developing during the last few years. The particular ways in which European countries have approached the problem have been markedly differentiated by racial temperament, institutional development, and inindustrial conditions. Germany, with her policy of fostering the old trade gilds and their supervision of apprenticeship, has found her particular problem met to a large extent by specialized industrial continuation schools, at first conducted in the evening and now to an increasing extent in the day. These schools have devoted themselves almost wholly to supplementary technical instruction; but in the continuation schools of Munich, Dr. Kerschensteiner has introduced trade work both to broaden the commercial routine and to lend zest and point to the other instruction.

One of the chief reasons why the continuation schools fulfill such an important function in German life is the fact that apprenticeship is not only general, but is entered into at the age of fourteen, at the time when youths leave the compulsory *Volksschule.* Another feature that distinguishes the German continuation schools, though shared to some extent with those of Austria and Switzerland, and which marks their seriousness of purpose, is that attendance upon them is generally compulsory until seventeen or eighteen years of age. In the cases where the continuation school classes have been brought into the day, employers are compelled by law to allow their apprentices time for attendance. Compulsory attendance upon the primary school is in this way immediately followed by the compulsory attendance at continuation schools of all boys, and sometimes girls, who do not attend higher schools.

Germany realizes full well that differentiation and specialization lie at the heart of effective industrial education, and must not only set the keynote of instruction as between various trades, but must be recognized in training the many grades of workers needed for her industrial army. Not only the rank and file, but the foreman, the superintendent, the master, and the technical office clerk must be provided for; and to this end have been developed for those whose ambitions and resources extend beyond the instruction of the continuation schools large numbers of day industrial or technical schools that touch all the important industries of the country. One of the salient characteristics of all these institutions, save an almost negligible few, is that they do not admit beginners to a course of practical work as a substitute for apprenticeship, but require for admission one to four years of experience under commercial conditions and then present courses of scientific and technical instruction bearing on particular industries. Another feature of many of these day schools, which illustrates a contrast between the German point of view and that of some other countries, particularly of the United States, where only large schools or classes are usually considered worth while, is the small size of the student body, a condition the Germans seem contented to maintain, provided the institution secures sound, definite, practical results of importance for its locality or the Empire.

In the efforts to adjust all of these schools as closely as possible to the actual industrial situation, many of the states have removed their control from the Ministry of Education and Public Worship and placed them under the Ministry of Commerce and Industry. The financial assistance afforded to industrial education by the state governments also represents another well defined policy and is a large element in the support of the various schools, being often one half to two thirds of the cost of maintenance. To the towns, however, is generally left the initial burden of buildings and equipment, a task in which they are often assisted by the local chambers of commerce and the gilds. And finally it should be noted that the measures for individual education have the hearty sympathy of the German labor unions, and that these bodies particularly approve the impartial supervision conducted by the State. The whole fabric of German industrial education in this way represents a remarkable example of coöperation between schools, employers, and workers, or, looked at in a larger way, between the state, municipalities, corporations, and the public, and testifies in a striking manner to the solidarity and unity of German life, and the profound belief in the school as an instrument of social efficiency.

Austria, following to a large extent in the footsteps of Germany, has also placed strong emphasis upon the continuation school and has made attendance thereon compulsory during the period of apprenticeship. The Austrian government, however, because of less satisfactory conditions of apprenticeship than in Germany, arising partly from the many races and nationalities in the country, has given more attention to the development of schools that supply a practical training as a substitute for apprenticeship. These craft schools, or *Fachschulen*, are widely distributed throughout the Empire, and comprehend both purely technical courses and art instruction as applied to the industries, the latter forming a very marked feature of Austrian education. Admission to these schools is nominally limited to those fourteen years old who have finished eight years of the elementary schools, but in outlying districts pupils under this age are allowed to enter. The duration of the courses in these schools is two, three, or four years, as the conditions of the particular industry demand, and the certificate given at the end of these periods is often accepted in place of apprenticeship experience. Among these schools are many dealing with the home or cottage industries — a phase of industrial education to which Austria has given particular attention. Another distinctive feature of governmental activity is the effort to promote and sustain the lesser industries or crafts, which are conducted in establishments of small size. To this end the Department for the Promotion of Crafts, under the Ministry of Public Works, has, particularly since 1908, through industrial museums and other institutions in different parts of the country, fostered exhibitions for handworkers, illustrating technical processes, and lectures upon advanced methods of production. Courses are also provided for those who hope to become masters, not only in technical methods of production, but in the economic principles essential for the successful conduct of a small business. The department goes even further, and assists in the formation of associations of handworkers, to which it supplies modern machinery and tools to be used in common by its members, and for which it requires payment only on long-term loans at a low rate of interest.

Switzerland, with her scant natural resources and consequent economic dependence upon skilled artisanship, has directed her main efforts to the fortifying and advancement of her apprenticeship system. To this end the canton of Zürich passed a law in 1905, the provisions of which have been followed by other cantons, which requires all apprentices to attend a continuation school for four hours weekly, and provides that this period may be taken from the working time. This provision is resulting to a large extent in bringing the instruction time in such schools into the day instead of evening. To further insure high and progressive standards of apprenticeship training, Zürich and other cantons have made it obligatory upon every apprentice to take an examination at the end of his course, which shall test his technical ability and knowledge of the trade. These examinations are supervised by the State, which also bears the necessary expense, and are conducted largely by trade organizations. At the successful passing of the examinations, a certificate of apprenticeship is issued. Switzerland also gives liberally toward the maintenance of trade and technical schools for advanced training of the more ambitious workers.

The development of industrial education in France presents marked contrasts in some respects to the measures above noted. Apprenticeship in France has been in a more or less unsatisfactory condition ever since the abolition of the gilds or corporations by the National Convention in 1791. Various attempts have been made to effect improvements both by municipalities and by associations, but these have not been particularly successful, and the most distinctive efforts of the French government in the field of industrial education have been directed toward the creation of schools that shall articulate directly with the elementary schools and supply a practical training to take the place of apprenticeship. These schools (*Ecoles pratiques de commerce et d'industrie*) admit pupils at thirteen years of age at the close of the primary school period, and give a three years' course, involving a generous amount of practical training in school workshops. The same feature of building directly upon a previous school training rather than upon required practical experience, characterizes the national schools for foremen, and those for superintendents and managers. In the emphasis placed upon this approach to trade training, the system fostered by the French government stands alone among European countries. Although there are a very large number of drawing and industrial evening classes throughout France, the continuation school has not received the attention or emphasis given to it in the Germanic countries. Attendance upon such schools is voluntary, and their sessions are almost always held in the evening.

United States. — In the United States the conditions which force attention to the problem of industrial education have only recently appeared. This country has lived over the long industrial history of western Europe in the brief span of little more than a century. Beginning with many of the activities of the hunting and fishing stage, as illustrated in the life of the pioneer and settler, eastern America passed through in rapid succession the agricultural or farming stage, the handicraft period, with its independent town economy, and reached in the closing years of the nineteenth century a highly developed national system marked by immense manufacturing growth.

Throughout this rapid evolution almost to the present time, the great demand for intelligent labor consequent upon the exploitation of the enormous natural resources of the country, has afforded countless opportunities for advancement to the individual workman gifted with superior wit and adaptability. Practical ingenuity and power of quick comprehension and adjustment have often under these conditions been of more importance in winning to positions of leadership and mastership than highly trained skill and technical knowledge. When to this situation has been added an enormous current of immigration that has served to supply not only skilled workmen, but a great army of unskilled and semi-skilled workers increasingly needed for manufacturing operations, it is apparent why for a generation of advanced industrial organization both the American employer and the native-born American workman have remained comparatively indifferent to the need of industrial education.

This period, however, has come nearly to an end, and the stress of international competition and lowered margins of profit make it more and more evident that American industrial development can only be maintained by recourse to old-world methods, and the adoption of comprehensive and effective measures that will insure a competent supply of highly expert workers. What has already been accomplished in the United States is largely the result of private enterprise and philanthropy. Until within a very few years, the public school system has given little or no attention to industrial education and has devoted its energies entirely to general and non-vocational instruction.

Evening Schools. — The first serious efforts to react upon the industrial situation were represented in the establishment of a number of important evening schools (*q.v.*), affording instruction in drawing, science, and mathematics. Cooper Union and the Mechanics Institute of New York, Franklin Union, and the Spring Garden Institute of Philadelphia, the Ohio Mechanics Institute of Cincinnati, and the Virginia Mechanics Institute of Richmond were all founded or opened their classes about the middle of the nineteenth century. Such schools, and many others, among which should be mentioned the evening classes of the Young Men's Christian Association (*q.v.*), have accomplished an important work in supplying supplementary technical instruction to the ambitious young workingman in the larger cities. Even in this direction, however, which represents the simplest and least expensive approach to industrial education, the public schools have been slow to follow. Their concern has been almost entirely with general studies, and it is only of late years that differentiated and specialized courses, related to industrial practice, have been introduced in the public schools of a few of the more important cities.

The early work of the evening industrial and technical schools consisted of various lines of drawing, to which were gradually added courses in science, mathematics, and technical subjects. Beginning about 1890, certain of these institutions established practical shop courses in a few of the high-grade mechanical trades, intended to broaden the experience obtained by the student during the day. In a few cases such classes have been incorporated in public evening schools, where they have sometimes performed a valuable practical service in advancing those employed at like occupations during the day, and sometimes have served merely to give a little tool dexterity to the amateur or the clerk.

Technical Schools. — The next important reaction of organized education upon the industrial situation was that which took place for the most part in the period of mining and railroad expansion following the Civil War, and which resulted in the establishment of many engineering schools or institutes of technology. The establishment of such schools was at first through private foundation, but the passage of the Morrill Act in 1862, by which large land grants were made to the states for the support of instruction in the agricultural and mechanical arts, resulted shortly in the inclusion of engineering departments in most of the western colleges and universities. The development of this type of institution has been widespread in the United States, and has produced an institution equal, and in some respects superior, to anything of its kind to be found abroad. The function of such schools is to produce the engineering and technical expert, the men needed to design industrial constructions, to devise technical processes, and to superintend industrial production. They, consequently, lie outside the scope of this article and are fully treated under Technical Education (*q.v.*).

Manual Training. — The first serious agitation for the inclusion of industrial training in the public schools was not for real vocational training, but for the inclusion of manual work in the general course of study as an element of culture and general efficiency. The Manual Training School connected with Washington University, St. Louis, opened classes in 1880, and was rapidly followed by the establishment of manual training high schools in other cities, some on private foundations, but in many cases organized as part of the public school system. From the high school manual training gradually made its way downward into the elementary school, until it is now represented in many cities throughout all the grades. The office of such instruction, however, both in theory and results, is not vocational training, which is always a matter of specialized instruction and self-determined groups, but as a broadening and energizing element in general education. (See MANUAL TRAINING.)

Trade Schools. — The first important attempt to deal with the problem of industrial training in day schools took the form of a trade school for the building trades. In 1881 the New York Trade School (*q.v.*) was founded by Richard T. Auchmuty. The founder was an architect by profession, and felt very keenly the small part played by American trained mechanics in the various building trades. Convinced that the apprenticeship system in the building trades was no longer effective, and that modern conditions gave no hope of its revival, he turned to the plan of a trade school as the only solution of the problem. To meet the economic difficulties involved in attendance, the courses in the school are only four months in duration, and only young men between the ages of seventeen and twenty-four are admitted. The aim of the school is to give a knowledge of processes and skill of hand sufficient for immediate practical usefulness, leaving speed and perfected skill to be developed in after experience.

The development of schools which aim to take the place of apprenticeship in whole or in part after this point was very gradual. In the first twenty years after the New York Trade School was founded, only two important institutions were added, viz. the Williamson Free School of Mechanical Trades near Philadelphia, and the Baron de Hirsch Trade School of New York. Since the year 1910 some ten or twelve institutions that may strictly be called trade schools have developed in different parts of the country under either public or private support, as well as a number of commercially conducted schools in the building and other trades. In 1907 the trade school entered upon the stage of public administration. In that year the already established Milwaukee School of Trades was taken over by the city under the terms of the industrial education law passed by the Wisconsin legislature. Since that date public trade schools have been opened in Philadelphia, Pa., Portland, Ore., Worcester, Mass., and Indianapolis, Ind.

Certain of these schools — the New York Trade School and the Baron de Hirsch School — represent the short-course type; the others offer courses of two or three years in which practical trade training is supplemented by instruction in drawing and technical practice, and in some cases by science and mathematics. Tuition in such schools is either free or on a nominal basis, a condition made possible either by large endowments or public support. Such schools are still somewhat in the experimental stage. They labor under very severe economic difficulties, first among which is the problem of support presented to the student worker during the period of instruction. Training for the skilled trades in the United States is in common practice restricted to the period above sixteen years of age, and as the great bulk of the youth who will form the mechanics and industrial workers of the country must of necessity enter upon remunerative work at sixteen or shortly after, the sacrifices necessary to permit attendance at a trade school can be expected only from a comparative few. The second aspect of the economic problem in relation to such schools is found in the large expense of administration, instruction, materials, and physical maintenance in proportion to the number of students that can be instructed. Furthermore, it is only in a few high-grade trades, the full command of which involves extensive subject matter and breadth of experience, that trade school training can claim sufficient advantages over training under commercial conditions to repay its expense. It is, consequently, only in cities representing exceptional concentration of such industries that trade schools can expect support, and it is not yet entirely clear whether the results obtained will prove proportionate to their expense.

In the earlier agitation for industrial training in the United States, the trade school occupied the forefront of discussion and was usually considered as the one institution needed to solve the entire problem, but as the great economic difficulties of attendance for youth and young men who are to become ordinary workmen have come to be better apprehended, it is seen that such institutions can, as far as numbers are concerned, fulfill only a very subordinate office, and that this in the case of the long-course schools will probably be to train a comparatively small number of highly equipped workers in a few of the skilled trades.

Preparatory Trade Schools. — Conditions similar to those noted above in the case of England have recently brought forward in the Eastern states the type of school called a preparatory trade school or intermediate industrial school. The situation of the fourteen-year-old boy in the United States is more acute even than in England, inasmuch as the disinclination on the part of employers in the skilled trades and high-grade industries to employ youth below sixteen years of age is much more general. Since the report of the Massachusetts Commission on Industrial and Technical Education in 1906, which pointed out the large numbers of boys and girls in that state who leave school at fourteen before graduation from the elementary school, the demoralizing influences that surround them, and the lack of economic progress made by such children, interest in a type of industrial school that shall aim particularly at the ages from fourteen to sixteen has been steadily growing.

The first school of this type to be established was at Rochester, N.Y., in 1908. Since then a considerable number of schools providing practical work in one or more of the large trade groups, together with related instruction in drawing, elementary science, history, English, shop calculations, accounting, and business forms, have been organized in Massachusetts and the state of New York. Such schools aim to give the advantage of some amount of industrial intelligence and knowledge of shop methods and materials to the boy or girl of sixteen in entering upon industrial employment rather than to impart a trade training.

This type of school points to the fact that forces other than the purely economic enter into the movement for industrial education, and that responsibilities are involved in the conduct of such education beyond those of developing industrial efficiency. The causes that have brought the preparatory trade school into being in the United States are not alone the economic advantage to the industries in preparing better material for entrance therein, an advantage that employers would be quick to perceive yet slow to bring about; but rather the recognition on the part of the public of a social obligation to better the opportunities for great numbers of young persons to enter upon more substantial careers. These schools also serve to illustrate the fact that any institution which enters upon the task of industrial education cannot escape the responsibility of advancing at the same time the training of its students in social and civic efficiency. It is very evident that no school under any form of representative government can command public support or claim a large place as an educational factor in dealing with the education of youth that does not attempt to instruct the individual in his relations to the State as well as in promoting his economic efficiency.

Part-time and Coöperative Plan. — The two schools just described aim to prepare for entrance into the industries by training beginners, a task only economically justifiable when such training cannot be obtained under commercial conditions. Of late years new types of school — the part-time day school and the coöperative school — that aim to give instruction to the individual at the same time that he is gaining practical experience in the industry, have assumed importance. Such schools do not attempt the entire task of training the learner at any period, but divide the work with organized industry, leaving to industry the practical training, and providing in the school those elements that industry cannot readily supply. These schools, together with evening industrial schools and correspondence schools, bring formal instruction into essentially coöperative relations with industry, avoiding the large financial burden of practical trade training, with its many difficult problems, and undertaking only those lines of instruction with which the school is prepared to deal readily and effectively.

The important practical results of the German, and, in particular, the Munich continuation schools, that have brought instruction into the period of the regular working day, have produced a growing conviction as to the importance of such schools in the development of industrial education in America. The more individualistic spirit under which industry is conducted in the United States, and the great variety of conditions represented, make progress toward such an arrangement necessarily a very gradual matter, and it will undoubtedly be a considerable time before any general agreement among manufacturers will be reached to allow learners in their establishments to attend industrial schools during the working hours. Nevertheless, the increasing discussion and study of this plan, and the recognition of its important advantages, indicate that its considerable extension may be expected in the near future. Such a plan is more rapidly applied in cities, where the concentration of a few high-grade industries gives a large number of apprentices and learners in particular lines. If such schools are to increase beyond the field of these few skilled trades, it is evident that the problems of instruction become complex and difficult. In the case of low-grade factory industries, where little opportunity for technical instruction is to be found in industrial content, school instruction must necessarily assume other directions and find its opportunity in increasing the social horizon or homekeeping usefulness of the pupil, or in aiding to develop capacity for change of occupation. It is evident that the beginnings of such schools as are represented at Cincinnati and Worcester, Mass., must be necessarily upon a voluntary attendance basis, and many years must obviously elapse before public opinion in the United States reaches the point of authorizing compulsory attendance for a term of years, as is the case in southern Germany.

The coöperative plan by which the students spend half their time at work in industrial establishments and half in school, and which was first developed in the Engineering Department of the University of Cincinnati, has lately been applied to students of high school grade. This plan differs from the part-time plan in some important respects. In the first place the student body consists of enrolled high school students and not of apprentices already employed in commercial establishments. This fact insures a higher grade of academic preparation than is generally the case with apprentices, and the larger amount of time spent in school allows the general education to be carried much further. Encouraging beginnings have been made with this type of school at Fitchburg, Mass., and Cincinnati, Ohio; but it is too early to define its future place. Whether, on the one hand, any considerable number of those aiming at and fitted for regular mechanics work in the trades will be drawn to such schools, or whether, on the other hand, they will develop capacity for training leaders of the foreman and expert type, remains to be seen.

In this same group of supplementary or coöperating schools might be included the correspondence schools (*q.v.*), which enroll a great number of young men engaged in industrial employment in the United States, and afford instruction by mail in a large number of technical subjects.

Apprenticeship and Corporation Schools. — The apprenticeship or corporation school, which has been developed in several industrial corporations of large size in the United States, is in a sense a part-time school in which both practical training and instruction are given within the commercial establishment. (See APPRENTICESHIP SCHOOLS.) Such a plan, which allows a maximum coördination between all lines of instruction, will probably be increasingly adopted in the case of railroads and other large corporations dealing with high-grade workers; but for the great majority of industrial establishments, such a system is hardly practicable, and division of labor between the employer on the one hand and the public school on the other is the method making for greatest efficiency and economy.

Secondary Technical Schools. — The middle technical schools of Germany have no exact counterpart in the United States, but the several schools for the textile industry correspond closely to this type. Most prominent among these institutions are the Textile School of the Pennsylvania Museum at Philadelphia, established 1884 and noted for the high grade of its instruction, three state-aided schools in Massachusetts at Lowell, New Bedford, and Fall River, and the Textile Department of the Georgia School of Technology at Atlanta. None of these schools requires previous practical training in the textile industry for admission, but in each school there are a number of mature students with such experience, and the character of the work approximates closely to that of the German schools.

Of late years other technical schools or classes of secondary rank have appeared, such as the day courses in machine design and applied electricity of Pratt Institute, Brooklyn, the Technological High School of the Ohio Mechanics Institute at Cincinnati, and certain courses in the Drexel Institute, Philadelphia, and in the Lewis Institute of Chicago.

Technical High Schools. — The question whether technical high schools with the same requirements of admission as regular public secondary schools can be incorporated into the American public school system has received considerable discussion of late years. The manual training schools, as above noted, do not contribute trained workers to the industries, and strong arguments have been made toward the conversion of these schools into technical high schools, having the distinct purpose of preparing pupils for industrial leadership, that is, for positions in industrial life requiring skill and technical knowledge, and of greater importance and responsibility than those of skilled mechanics. The serious question facing such a proposition is whether such results can be secured from a type of school that does not require practical experience before entrance, as in the case of the German technical schools, or provide parallel experience, as in the case of the coöperative schools.

Legislation. — Laws have been passed in a number of states providing for state supervision of industrial education and in several cases for the establishment and assistance of industrial and trade schools. Massachusetts was the first to act in this direction. In 1906 a State Commission on Industrial Education was created, with power to superintend the establishment and maintenance of industrial schools for boys and girls. The act further provided for the reimbursement to cities and towns of a part of the amount expended for the support of such schools. After two years of trial, the plan of an independent commission was found to be unsatisfactory, and the administration of the law was vested in the reorganized State Board of Education, with provision for a special commissioner to deal with the field of industrial education. Since the reorganization the state board has accomplished very important work in standardizing the various types of schools that come under its control in regard to scope, courses of study, and methods of instruction, as well as in furthering the establishment of a considerable number of schools.

New York State enacted a law in 1909 authorizing the establishment of general industrial schools, trade schools, and schools of agriculture, mechanical arts, and homemaking, and providing for the award to such schools of a certain measure of state support. The disbursement of state moneys to the schools is by the terms of the act placed in the hands of the State Commissioner of Education and made dependent upon his approval of the courses of study maintained. The establishment and conduct of these schools is referred to the local boards of education, but the appointment of advisory boards representing the local trades, industries, and occupations is made compulsory. The duties of such advisory boards are to counsel with and advise the boards of education in regard to the establishment and conduct of the schools.

In 1907 a law was passed in the state of Wisconsin empowering cities or school districts to establish, conduct, and maintain schools for the purpose of giving practical instruction in the useful trades, and placing such schools under the supervision and control of the local school boards. Permission was given to the school boards to appoint advisory committees to assist in the administration of the trade schools, and provision was made for the levy of a special local tax for the establishment and maintenance of such schools. The law was amended in 1909, and the minimum age of entrance to a trade school reduced from sixteen years to fourteen years for both young men and young women. In 1911 the state passed a number of acts relating to industrial education, which among other measures provides (1) for a modification of the apprenticeship laws of the state by which apprentices shall receive instruction of not less than five hours a week. (2) That whenever any evening school, continuation classes, industrial school, or commercial school shall be established for minors between the ages of fourteen and sixteen working under permit provided by law, every such child shall attend such school not less than five hours per week for six months in each year, and every employer shall allow all minor employees over fourteen and under sixteen years of age a corresponding reduction in hours of work. (3) That employers shall allow a reduction in hours of work at the time when the classes are held whenever the working time and that of the class coincide. (4) That a state board of education be appointed to control the distribution of state moneys under the act.

Other states have recognized industrial education through legislative measures to the extent of providing official machinery for the development and supervision of such work, and in still other states investigating commissions have been appointed with the object of ultimate legislation in this direction.

C. R. R.

Germany. — The history of industrial education in Germany is intimately bound up with the development of continuation schools and with the system of apprenticeship. Established at first to give instruction in reading, writing, arithmetic, and religion for one or two hours on Sundays, the early continuation school, like its present successor, aimed to secure efficient citizens. The first Sunday continuation school appears to have been founded by the Bishop of Samland in 1569; this system was warmly supported and encouraged by the pietist Spener. Continuation Sunday schools were established by law in Württemberg in 1695 to supplement the limited work of the elementary schools; in 1739 they were extended to boys who had left school; in 1810 these schools were authorized not only to repeat the elementary school work, but to give further education. Baden instituted the Sunday school system in 1756, and in 1803 attached continuation schools to the existing elementary schools. In Bavaria the schools were introduced in 1771, and in 1803 attendance was made compulsory for apprentices up to the age of eighteen. Repetition courses were provided for in Prussia by the *Generallandschulreglement* (1763). At the beginning of the nineteenth century the spread of continuation schools was encouraged by town councils and industrial associations, but the interest was soon relaxed as the system of elementary schools became more widely established. The real success of the continuation schools goes back to the Industrial Law passed by the North German Federation in 1869, by which local bodies were allowed to make attendance at continuation schools compulsory on all workmen under eighteen, while employers were compelled to allow such attendance. This law formed the basis of the later Imperial Industrial Law of 1891 (*Reichsgewerbeordnung*) extended by the law of 1900: —

> SECTION 120. — Employers of labor are required to grant to those of their employees under eighteen years of age who attend a Continuation School arranged by the Government or by the local authority the necessary time for school attendance as prescribed by the authority in question. Classes are only allowed on Sundays if they do not interfere with attendance at Divine Service.
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> SECTION 142. — By the by-law of a District or Town Council attendance at Continuation Schools can be made compulsory for male persons under eighteen years. The regulations necessary to enforce compulsory regular attendance at such schools may be fixed by the local authority, and the duties of pupils, parents, guardians, and employers may be so defined as to ensure the regular attendance, the discipline, and the orderly behavior of the pupils. Those pupils are relieved from the attendance at such compulsory schools who attend a gild or *Fach* school, provided that such a school is recognized by the superior administrative authority as equivalent in status to the said Continuation School.
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> SECTION 150. — A fine of twenty marks ($5), or, if this is not paid, imprisonment up to three days for every offense, is imposed upon any one contravening any of the above regulations.

The greatest impetus to the development of a system of further education came immediately after the Franco-German war, which was consciously inspired by the desire to enter into the commercial and industrial competition of the world. Continuation schools were made either (1) compulsory by local by-laws, as in Prussia (1874), Baden (1874), Saxe-Altenburg (1889), Saxe-Coburg-Gotha (1874), Anhalt (1874), Brunswick (1878), Oldenburg (1874), Mecklenburg-Strelitz (1873), Schwarzburg-Rudolstadt (1875), Lippe (1874), Reuss j. L. (1874; compulsory by state law 1900), Alsace-Lorraine (1873); or (2) compulsory by state law, as in Bavaria (1803), Saxony (1873), Württemberg (1895), Hesse (1874), Saxe-Weimar (1874), Saxe-Meiningen (1874), Mecklenburg-Schwerin (1905), Schwarzburg-Sondershausen (1874), Waldeck (1895), Bremen (1908); or (3) was left voluntary as in Reuss ä. L., Schaumburg-Lippe, Hamburg, and Lübeck. In the movement for the spread of compulsory systems the *Deutsche Verband für das Fortbildungsschulwesen* (f. 1892) has taken a very prominent part.

Within the last twenty years the development of continuation schools intended for general education rather than specific industrial or vocational training coalesced with another movement for the provisions of industrial education. While the gilds continued in full vigor, the apprenticeship system, with all that it implied in the way of training and moral oversight, could take the place of a state-organized system of vocational education. But the rise of German solidarity and the introduction of national free trade broke the power of the gilds, and something had to take the place of the apprenticeship system At the same time the growing complexities of industry which made more and more demands on science, made desirable a training of a type which the individual employer could not give. In 1765 the *Gesellschaft für Beförderung der Künste und nützlichen Gewerbe* (Society for the Promotion of the Arts and Useful Trades) was established in Hamburg, and recommended classes for architectural drawing. Classes were organized, and new subjects were added constantly. In 1865 the society's school was taken over by the city and was maintained as the *Allgemeine Gewerbeschule.* The success of this school led to similar establishments in Berlin (*Handwerkerschule*), and at Hanover, Brunswick, Kiel, Lübeck, Magdeburg, Cologne, Breslau. A *Feiertagsschule für Gesellen und Lehrlinge* (Vacation School for Journeymen and Apprentices) was established at Munich in 1793, giving instructions in the three R's, chemistry, physics, geometry, practical mechanics, law, history, geography, and nature study. The school met with considerable success, and in 1825 an elementary section was added. At Weimar and Eisenach and other towns of Saxe-Weimar free industrial schools (*Freie Gewerbeschule*) arose toward the end of the eighteenth century which laid special emphasis on drawing and geometry. In Saxony town councils and industrial corporations established schools about 1820 for instruction in arithmetic, German, and drawing, and by the law of 1835 continuation schools were empowered to teach such subjects as were not taught in the lower schools, but interest flagged when after 1859 the gilds were deprived of the power to compel attendance on the part of their apprentices. The most continuous development of industrial schools with voluntary attendance has taken place in Württemberg. Beginning in 1818 there were eighteen such schools in 1826; in the preceding year they were placed under the charge of the Royal School Board; instruction, given on Sundays, covered drawing, industrial arithmetic, geography, geometry, mechanics, trigonometry, bookkeeping, and estimating. In 1853 the schools were placed under the Royal Commission for Industrial Continuation Schools, with representatives of the Departments of Education and of the Interior. Evening Industrial Schools were soon added by the Commissioner. They were maintained by local bodies with support from the state. After Württemberg joined the Empire and the *Reichsgewerberordnung* became applicable to it, many communities made attendance at the industrial improvement school compulsory for apprentices.

Present Position. — Attendance at continuation schools is now compulsory in twenty-two out of twenty-six German states. Of these, nine still allow the local bodies to make their own by-laws on the subject. Prussia is still among this number, except for the Western section and Posen, where the compulsory system has been introduced largely for political and administrative reasons. As a general rule compulsion applies only to boys. The rapid and extensive development of elementary education has eliminated the necessity of general continuation schools where the work of the lower school is repeated. Many of these schools, of course, still exist, but they are intended for the class of unskilled laborers. In most states attention is given almost entirely to commercial and industrial education. (The former is discussed under COMMERCIAL EDUCATION.) The reasons for this are theoretical and practical. It has been recognized that the success of instruction depends on concentrating on the vocation of the pupils; this gives unity to the pupils' work and on the other side meets the practical demand for more efficient workmen to assist in the rapid industrial advance of Germany. Hence the aims of these lower industrial schools may be defined as efficiency and citizenship, and in so far as the instruction is not narrowed down to the pupils' vocation, but takes in all its ramifications, such education may serve humanistic and cultural ends. Hence the reformed continuation school requires a different kind of equipment. Workshops and laboratories are now regarded by theorists as important adjuncts of the schools, and have been adopted largely in South Germany. Practice varies, however, and in some systems only theoretical instruction is given in the schools, while the practical work is regarded as sufficient. The value of the new type of industrial continuation schools is shown by the number of students who come voluntarily after the period of compulsory attendance to take work in the classes for journeymen and master workmen.

Where attendance at a continuation school is compulsory on girls, instruction is given to train them as mothers and housewives as well as to render them more efficient at their vocation.

The period of compulsory attendance runs parallel, as a rule, with the period of apprenticeship, that is, from fourteen to eighteen years of age. Within this period a boy must attend school for two or three years. The increasing importance of the industrial continuation schools in the national system is attested by the growing practice of holding the classes during the day. It is recognized that with the increasing importance of the studies, pupils cannot be expected to be fresh at the end of a long day. Thus in Württemberg, Hesse, and Weimar no instruction is permitted after 7 P.M.; in Prussia it is not allowed after 8 or 8.30. The tendency on the whole is now to have special school buildings, made necessary by the need of increased equipment, and to give instruction throughout the day. The number of hours which a pupil is obliged to attend varies considerably; where the instruction is merely repetition of primary work, two hours a week are sufficient; where an attempt is made to make the education of real social value from four to eight hours a week are given. Instruction extends over the whole of the usual school year, that is, for about forty weeks. Different arrangements are made with different trades and industries, so that attendance does not become an unnecessary burden; thus in some places bakers and confectioners are released from school during the rush of the Christmas holidays; builders and painters, on the other hand, attend mainly during the slack winter season. On the whole, employers are now willing to allow their young employees the necessary time for school attendance, and are beginning to recognize the value of the instruction given, though it is indirectly at their expense for the time being. The greatest opposition is met with in commercial offices, where it is sometimes a matter of difficulty to release the young clerks at certain times of the day. But the school authorities are ready to accommodate the hours of school attendance to the wishes of employers.

The provision of industrial continuation schools has been more rapid than the supply of properly qualified teachers. For the general continuation schools the elementary school teachers were a good source of supply, and even with the addition of new academic subjects, the elementary teachers gave satisfactory service, preparing themselves privately for their special work. The training of teachers of drawing was also of a high standard, though here too the new industrial needs required a different emphasis. The chief difficulty arose, however, upon the introduction of workshops and machine shops into the school and the arrangement of day classes. Two methods of supplying teachers have been adopted: elementary school teachers are given short courses and make themselves acquainted with the practical working of a factory; and master workmen are taken from the factories and given short courses in methods of teaching. In only a few instances have special courses been established for training industrial teachers; the most notable institutions are the training school at Carlsruhe at the Building Trades School, and the courses at the Imperial Technical School at Strassburg. Generally, however, short six weeks' courses are given: in Berlin courses are held in upholstery, baking, hairdressing, book trades, modeling, metalwork, masonry and carpentry, house painting, pottery and anatomy, hygiene and first aid. Visits are made to factories, and instruction is given in tools, machines, and materials. At Düsseldorf a short course of lectures on method is given to teachers selected from the trades. The *Deutsche Verein für Fortbildungsschulen* conducts short courses at Leipzig and Frankfort a. M. for continuation school teachers. Courses are also conducted by the Prussian Ministry for Commerce and Industry and by the Ministry of Agriculture for teachers in their respective fields. Another means of training has been the encouragement of journeys of investigation (*Studienreisen*). But it seems highly probable that a more definite system of training will be introduced as the number of industrial schools, fully equipped on the mechanical side, increases, and the candidates will be drawn equally from school and workshops. Further must be mentioned conferences and discussions, as for example a three-day course in technical drawing held at Chemnitz, and conferences on spinning held in the same town.

The administration of industrial continuation schools has in most states been taken out of the hands of the central boards of education. In Prussia the supreme control is under the Ministry of Commerce and Labor, in Saxony the Ministry of the Interior, and in Württemberg the Higher Industrial School Council. The publicly maintained schools are locally under the municipal authorities, which in all cases receive state grants. Generally there are associated with each school advisory councils representing the community, chambers of commerce, gilds, and other industrial societies. Frequently the gilds, and industrial societies contribute to the support of schools; in a number of cases these bodies furnish the necessary tools and mechanical equipment.

The continuation schools may be divided into three broad divisions, — general, industrial, and commercial. The general continuation schools give instruction in the elementary school subjects, and add drawing, civics, and hygiene. The commercial courses are provided for girls as well as boys. (See, however, COMMERCIAL EDUCATION.) The purely industrial courses are found in the larger towns, where the numbers of employees in different occupations justify such an arrangement organized in groups. Where twenty-five to forty students following one occupation are found, a special course is provided for them. Where the numbers are too small, and for unskilled labor, the pupils are sent to the general continuation schools. Girls may be compelled, and those in commercial occupations are compelled, to attend continuation schools, but usually the period of attendance is not so long as for boys. Courses for girls are, however, not so generally provided. The general courses cover not only the elementary school subjects, but also female handicrafts, household arts, cookery, etc.

One general distinction must be made between North and South Germany. The southern states, on the whole, have been more progressive in the provision of industrial continuation schools and adapting courses to various local industries and occupations, and have been careful to combine theoretical and practical work. In the north the schools as a rule confine themselves to general theoretical courses and leave either employers or associations to take care of the practical sides. So a comparison can be made between the subjects taught in Prussia and in Bavaria. *Prussia:* German, arithmetic, drawing, business routine, and composition, technology, government, labor laws and conditions, insurance, economics, industrial arithmetic, and practical drawing, according to the various trades, are found generally, and in the larger towns also geometry, trigonometry, algebra, physics, chemistry, electrotechnics, English, history, shorthand, typewriting, bookkeeping, exchange, materials, law, gymnastics, and singing. *Bavaria:* the fundamentals are religion, German, business correspondence, arithmetic, drawing, geometry, nature study, chemistry, materials and bookkeeping, and then the specialized vocational courses. The following courses as arranged in a few representative towns will indicate the organization more clearly.

Strassburg: (1) Building groups (stone masons, cement workers, stovemakers, joiners, cabinetmakers, coopers, locksmiths, boilermakers, tin and copper smiths, upholsterers, etc.). (2) Commercial groups. (3) Trade groups (grocers, shoemakers, druggists, errand boys, bakers, butchers, tailors, waiters, cooks, barbers, confectioners, printers). (4) Unskilled labor.

Leipzig: (1) Unskilled labor. (2) Technical groups. (3) Combined technical groups where the numbers are not large enough for separate classes. (4) Private schools.

Berlin: (1) Building trades, clerks, metal workers, art crafts, provision dealers, potters, tailors, woodworkers, leather workers, confectioners. (2) Private schools (printers, butchers, chimney sweeps, saddlers, painters, barbers, etc.). (3) Unskilled labor.

Düsseldorf: (1) Unskilled labor. (2) Engineers, electricians, mechanics, and watchmakers, plumbers and fitters, building trades, painters, art crafts, printers, turners, gardeners, confectioners, bakers, shoemakers and tailors, upholsterers, decorators, barbers and hairdressers, butchers, errand boys.

The Munich system, which, as organized by the School Superintendent, Dr. G. Kerschensteiner, has attracted attention throughout the world, deserves more detailed treatment. Here attendance at a continuation school is compulsory for boys up to eighteen, or during their period of apprenticeship; for girls the period of obligatory day attendance is three years. Boys attend from eight to ten hours a week, girls only six hours, although they may attend a voluntary course up to twelve hours a week. An eighth class has been organized in the elementary schools, obligatory for boys, voluntary for girls. This class is intended to bridge the gap between the elementary school and employment, and is preparatory to the industrial courses of the continuation school, the chief emphasis being on manual work. The continuation schools for boys consist of twelve general and fifty-two trade schools for apprentices. The general courses are attended by errand boys, unskilled laborers, and the groups which are too small for a special school. For girls there are forty compulsory schools giving household training, and twenty-one voluntary schools providing household training, commercial, and industrial courses. A trade or industrial school is established where there are twenty-five apprentices of one industry.. Higher divisions are also provided for journeymen and master workmen who attend voluntarily. The schools, with the exception of six, are located in their own buildings; the six exceptions use primary schools. Attached to each school are associations of employers who pay for materials, discuss courses of study, recommend technical teachers, supervise and examine the practical work. The board of each school consists of the headmaster, a member of the city council, and three employers. Pupils attend one day or two half days, forfeiting wages for that period. The teachers are drawn from journeymen, artisans, master workmen, and professional teachers. The expenses of maintaining the school for boys are shared by the state and the city; schools for girls are maintained by the city alone. The curriculum covers drawing and arithmetic, practical and applied to the special industries; tools; machines; physics; chemistry; German literature; religion (up to sixteen); civics; historical development of the specific trades and their interrelations; the individual in relation to town and state; hygiene; gymnastics; and games.

The schools are organized as follows: (1) Commercial classes. (2) General continuation classes. (3) Technical or trade classes (turners, druggists, wood carvers, stokers, chimney sweeps, coachmen, saddlers, glovemakers, vatters, coopers, locksmiths, smiths and carriage builders, carpenters and joiners, upholsterers, decorators, stovemakers, watchmakers, engineers, mechanics, plumbers, fitters, bookbinders, printers, photographers, lithographers, barbers, confectioners, house painters, enamelers and gilders, innkeepers, butchers, shoemakers, masons, jewelers and goldsmiths, stucco and stone workers, dentists' assistants, glass and porcelain workers).

The best organized state system is that of Württemberg, which in 1907 passed a comprehensive law for the establishment of industrial and commercial continuation schools. Local communities are compelled whenever for three successive years the number of employees reaches forty to establish industrial continuation schools in the first place and commercial schools in the second. All workmen under eighteen must attend such a school for three years, although local by-laws may extend this period to four. Girls' schools may be established locally. Tuition may be charged, and employers may be compelled to pay it. Instruction should be given during the day up to 7 P.M. for 280 hours a year. Teachers are trained at Carlsruhe for industrial schools, and at Leipzig and other universities for commercial. They are drawn from elementary school teachers and from employees in workshops and factories. All are required to have had practical work in shops for at least two months. The schools do not give practical work, as is the case in Munich. Schools have also been established for women's occupations, and give courses in needlework, embroidery, machine stitching, dressmaking, knitting, correspondence, bookkeeping, and commercial arithmetic. Traveling instructors have for a long time been employed to give short courses in handloom weaving, technical courses (three to twenty-one days), and courses for teachers, masterworkmen, and merchants.

Day Trade and Industrial Education. — In addition to the system of industrial continuation schools, there exists in Germany a large number of day schools with courses varying from a duration of six months to four years. They are voluntary, and tuition is charged. Schools have been provided by the states, by cities and local authorities, and by private organizations or societies interested in commerce and industry. Generally there is a state subsidy. Here it is proposed to deal with those schools which require only a knowledge of the elementary branches for admission. They aim to furnish not only efficient workmen and servants, but to train master workmen, supervisors, and foremen. In most instances the schools insist that candidates shall have had practical experience in a workshop or factory for one or two years. In some schools attendance takes the place of apprenticeship, in others it is supplementary, and in others again the courses are intended for journeymen. The schools are known as middle or lower technical schools (*mittlere und niedere Fachschulen*), to distinguish them from the higher technical schools and the technical universities, both of which have higher entrance requirements. (See TECHNICAL EDUCATION.)

In Prussia a number of industrial schools (*Gewerbeschulen*) arose in 1828, and met with success; the entrance requirements were raised, and in 1878 they were transformed into *Oberrealschulen*. New schools were established to take their place, *e.g.* Municipal Artisan School in Berlin, 1880; Iron Workers' School at Remscheid, 1880; Machine Construction School at Cologne, 1881; Spinning Schools at Aachen, Berlin, Cottbus, 1883; Industrial Arts School in Düsseldorf, 1883. In 1884 this type of schools was placed under the Ministry of Labor and Commerce. The development was rapid after 1890, and many municipal schools were taken over by the State. (See *Rep. U. S. Com. Ed.* 1910, pp. 324–329, for list of vocational schools in Prussia.) The following types of schools have been developed: building trade schools for the preparation and training of workmen and foremen in all that pertains to building, masonry, carpentry, sanitation, drainage, surface improvement, etc. Many officers for city, state, army, and railway administration of buildings and roads are trained. Students are admitted at the age of sixteen, and must have had practical experience. The course lasts four years, and is given as a rule in the winter months.

Schools for machine construction and foundry work give a two years' course for lower technical officers based on common school training and four years practical experience. Many of the lower schools are attached to a higher technical school, and in some cases students are allowed to pass from the one to the other.

A two years' course of study and practice is provided in the Schools for Metal Industries at Iserlohn, Remscheid, Siegen, and Schmalkalden. The entrance requirements are the common school branches. In these courses are trained pattern makers, engravers, locksmiths, turners, printers, etc.

At Höhr and Bunzlau schools are maintained for the ceramic industries. One year of practical work in addition to the common school branches is required for entrance. Courses are given in German and arithmetic, drawing and painting, chemistry, physics, mineralogy, geology, ceramic technology, and practical work in the shops.

The textile schools were reorganized in 1896, and afford training for master workmen and young manufacturers in spinning and the allied trades. Traveling teachers are also employed for the country districts where the handloom has still been retained.

There are besides special schools, like the navigation schools, schools of mines, schools for blacksmiths. For girls and young women there are courses in women's handicrafts, machine stitching, white work, laundry, dressmaking, art embroidery, lace making, commercial subjects, and household arts.

The other German states have provided similar schools through the same organizations as in Prussia. Variations occur as demanded by the different industries. In addition to the types of schools referred to above, there are, for example, in Bavaria schools in the wood industries — carving, cabinet making, toys, etc. Such schools are maintained at Berchtesgaden, Oberammergau, Partenkirchen, and Fürth. Saxony spends more on industrial schools of all grades than any other German state. At Chemnitz the Technical Institute has several thousand students in the different departments of machine construction, industrial drawing, building construction, textile branches. Each of these branches is also cared for by separate institutions in other towns: textile schools at Reichenbach, Zittau, Plauen, Groschönau, etc.; machine construction at Mittweida, Zwickau, and Hainichen. To the Royal Industrial School at Plauen a museum is attached, with models, designs, patterns, natural objects, etc. The handworkers' schools aim to give general industrial courses to apprentices and master workers; such schools are found at Dresden, Leipzig, and Bautzen. In Saxony are located a number of national schools maintained primarily by private societies throughout Germany with state or city support. Among these may be mentioned the Tinworkers' School at Aue, the Locksmiths' School at Rosswein, Watchmakers' School at Glashütte, Turners' and Carvers' School at Leipzig, Tanners' School at Freiberg, and the Millers' School at Dippoldiswalde.

The same provision of industrial schools is found in Württemberg. At Reutlingen there is the Technicum for the weaving industry, giving instruction in spinning and weaving for manufacturers, superintendents, and master workmen engaged in the textile industries. Other schools in the same field are located at Heidenheim, Laichingen, Sindelfingen, and Sontheim. A state school for skilled mechanics at Schwenningen offers courses in watch and clock making and electrotechnical work. Supported by the state and city, there is at Stuttgart a school for the book printing trades under the auspices of the Union of Proprietors of the Book Printing Establishments.

Industrial Art Schools. — Within the scope of industrial education must also be included the industrial art schools, which are nearly all under direct state control. While the artistic side of the industries is by no means neglected, the emphasis in the industrial school falls primarily on the industry involved. The industrial art schools give instruction in the arts as applied to industries, and as a rule are general in scope, and while a few provide courses with reference to special industries, they require a preparatory general course. The schools admit pupils at the age of sixteen, and generally require two years of practical workshop experience. The course extends over two years. While fees are charged, numerous scholarships are offered. Some schools have, in addition to the general course, preparatory courses of two years, pupils being admitted at the age of fourteen. The instruction in the industrial art schools covers the following subjects: all branches of drawing, architectural drawing, modeling, decorative arts, wood carving, painting, enameling, chasing, pattern designing, engraving, art embroidery. Some schools, especially in Bavaria, give courses in glass and porcelain painting. In Prussia there are industrial schools at Berlin (*Königliche Kunstschule* and *Königliche Kunstgewerbemuseum*), at Breslau (*Königliche Kunst- und Kunstgewerbeschule*), at Düsseldorf (municipal *Kunstgewerbeschule*), at Frankfort a. M. (*Kunstgewerbeschule* of the *Kunstgewerbe-Verein*), Hanau a. M. (*Königliche Zeichen-Akademie*) for training art-jewelers, gold and silver smiths, etc.). The two chief industrial art schools are the *Königliche Kunstgewerbeschulen* at Munich and Nuremberg. In Saxony there are several special industrial art schools in addition to the *Königliche Kunstgewerbeschule* at Dresden, which also has a preparatory school. At Plauen courses are given in the application of the arts to textiles. The *Königliche Akademie der graphischen Künste und Buchgewerbe* at Leipzig pays special attention to the application of the arts to all branches of the book industry (lithography, woodcuts, engravings, photography, and manifolding). The state *Kunstgewerbeschule* at Stuttgart has preparatory courses in addition to the special courses which are divided into five courses, the arts applied to furniture, models, and woodcarving, decorative arts, chasing, and the teaching of drawing. Similar provisions are found throughout the country.

England. — As in Germany, industrial education in England has developed along several different lines. The system of apprenticeship disappeared earlier in England than on the European continent, and, although the industrial and commercial development was more rapid, little was done to promote training until the latter part of the nineteenth century. Classes for adults and young workers were established in the eighteenth and early nineteenth century in connection with the Sunday school movement (*q.v.*), the Society for the Promotion of Christian Knowledge (*q.v.*), the Adult Schools (*q.v.*), and the Mechanics' Institutes (*q.v.*). But only the two latter movements can be strictly said to have attempted to improve the efficiency of the working classes at their occupations. It was not until 1851 that national action was taken to promote the education of adults. In that year the government made grants to evening schools and classes. Two years after the Exhibition of 1851 the Department of Science and Art was established for the encouragement of instruction in drawing and science. From 1860 grants were given by the department on the result of written examinations; grants were also made for buildings, books, and equipment. In 1872 organized science schools, which offered instruction in science in courses of three years, were established, and might be held by day or night. The Department made grants in respect of the science work at these schools. Many day science schools in 1902 became secondary day schools. Grants have also been made by the Department for instruction in drawing and design. The Technical Instruction Act of 1889 was also administered by the Science and Art Department, and provided for "instruction in the principles of science and art applicable to industries and in the application of special branches of science and art to specific industries or employments." This act remained in force until 1902, and under it local authorities used the powers intrusted to them to provide instruction in almost every subject except the classics. In 1899 the Science and Art Department became a branch of the Board of Education. Many private associations also supported and encouraged the introduction of scientific instruction mainly into the evening classes. The chief of these was the City and Guilds of London Institute, an association founded in 1878 " for the purposes of all such branches of science and the fine arts as benefit or are of use to or may benefit or be of use to productive and technical industries, especially to commerce and industry generally. . . ." The department of technology of the Institute registers and inspects classes in technology and manual training and holds examinations annually in the subjects taught in these classes in the British Empire. Much of the early work in science and the technical branches, encouraged by the different movements referred to above, by various associations, and by the Department of Science and Art, has now been taken over by the local universities and technical schools, and since 1902 by secondary schools. (See ENGLAND, EDUCATION IN; TECHNICAL EDUCATION.)

In the present article only those forms of industrial education which are based directly on an elementary school course will be treated. Such instruction is given in higher elementary schools, evening schools (*q.v.*), and in day trade and technical schools. This classification is, however, incomplete if it neglects the provisions made by employers for giving special trade instruction to their apprentices. (See APPRENTICESHIP AND EDUCATION.) Nor is any account given here of the preparatory courses in the manual arts in elementary schools. (See MANUAL TRAINING.)

Higher Elementary Schools. — These schools were first recognized by a Minute of the Board of Education (Apr. 6, 1900) as schools organized to give a four years' course to pupils between the ages of ten and fifteen, with a curriculum including practical and theoretical science. Instruction was to be suited to the special circumstances of the districts which they served. By Article 38 (IV) of the Board of Education's Code for 1905, it was to be a condition of the recognition of such schools that " the curriculum must have for its object the development of the education given in the ordinary public elementary schools and the provision of special instruction bearing on the future occupations of the scholars, whether boys or girls." The reason for the establishment of such schools was thus stated by the Board: " The scholar who must at the age of fifteen begin an industrial employment or enter the lower ranks of business needs a course of instruction different from that of the secondary schools, and yet one which is higher in standard and somewhat more special in aim than that given in the ordinary public elementary schools." The number of such schools in the year 1909–1910 in the whole of England and Wales was not more than fifty-one, containing, on the last day of the school year, 10,771 scholars, of whom only 1375 were fifteen years of age or over. The hope that children would be induced to stay and complete a three years' course ending at fifteen years of age has been far from realized. In a number of cases no satisfactory attempt appears to have been made to give the curriculum a bias appropriate to the circumstances and the probable future occupations of the scholars. The Board's conclusion is that " it can hardly be said that the majority of higher elementary schools are in any special degree fulfilling what the Board conceived to be the true function of a school of this type." But, as the Board of Education admit, the comparative failure of higher elementary schools in England does not really indicate the failure of the principles underlying the scheme for their establishment.

As often happens, the central government has made its regulations too advanced, and the higher grants earned by a school definitely classified as a higher elementary school are eaten up by the greater costliness of fulfilling the structural and other conditions required to secure recognition. It is probable that large numbers of schools classified as ordinary elementary schools, *e.g.* such schools as have been recently organized in London under the name of central schools, are performing quite successfully the functions of a higher elementary school. According to the Report of the Education Committee of the London County Council made in March, 1910, the central schools should " be schools which will give their pupils a definite bias toward some kind of industrial or commercial work, while ensuring that their intelligence should be fully developed, and they should occupy a distinct position from the secondary school. They should avowedly frame their curricula with a view to the pupils leaving at an age between fifteen and sixteen. Their courses should be so framed as to provide for the pupil the best possible equipment for entering upon the industrial or commercial world as soon as he leaves school, while at the same time qualifying him to enter upon a special course of training for some particular industry at a polytechnic or similar institution, if he desires to continue his education further." The central schools were introduced in London in April, 1911. A similar type of school was established in Manchester in the same year.

Evening Schools. — The development of industrial training in higher elementary schools and in the higher classes of elementary schools may fairly be considered as an attempt to link on directly the elementary with the technical schools. But an intermediate link is felt by some to be, if not absolutely necessary, at any rate desirable. For the fairly large proportion of children who leave the elementary schools at fourteen without reaching the higher classes, and who are quite unfit to take their places in the technical school even of a comparatively low grade, it has long been sought to form a link by means of evening continuation schools; and certainly the evening continuation schools of Great Britain have done magnificent work, not only for the imperfectly educated, but also for those who have left the higher classes of elementary schools, where no attempt whatever has been made to bear industrial considerations in mind. The impasse caused by the Cockerton Judgment (*q.v.*), which forbade the use of rates for higher education in evening schools, was removed by the act of 1902, which permitted local authorities to support higher education. By the regulations of 1903 evening continuation schools may provide instruction in manual training (wood and metal work), any generalized or special branch of science, including mathematics, home occupations and industries. The curriculum is flexible, and may be adapted to local requirements. Evening technical classes with four or five year courses have also been established in connection with technical schools. They cover instruction in mathematics, drawing, physics, mechanics, machine construction, and some specialized work, *e.g.* mechanical or electrical engineering.

Day Trade Schools. — A recent attempt has been made to provide the link by means of certain day schools in various localities popularly described as "trade schools" or "preapprenticeship schools." As a matter of fact there are two grades of such schools: (*a*) the preapprenticeship school, (*b*) the trade school proper or apprenticeship school — the avowed object of which is to provide a substitute for the obsolescent apprenticeship system. Of the latter a useful account has been given by Mr. Blair, the education officer of the London County Council, in a paper read before the Imperial Education Conference held in London in 1911. He describes these schools as a development of the day school for boys or girls of thirteen or fourteen years of age, designed generally to provide a more specialized industrial curriculum than is held to be admissible in an elementary school. Their object is to prepare boys and girls to become intelligent workpeople with a chance of rising later, and it is naturally expected that many on leaving the trade school will pursue their education through the avenue of the technical school properly so-called, in many cases, of course, by attendance at evening classes.

As a typical illustration of one of the ten trade schools for boys in London may be taken the School of Building at Brixton, opened in 1908. The course is for three years, and admission is restricted to boys between thirteen and fifteen years of age, who have passed the sixth standard of an elementary school, or its equivalent. "The curriculum, which is common to all students during the first year, and which is looked upon as a probationary period, includes building construction, workshop practice, study of materials, workshop arithmetic and mathematics, experimental science, geometrical and plan drawing and lettering, freehand drawing of building details, English literature, history with special reference to industrial changes and the development of public and domestic architecture, geography with special reference to building materials, English composition, and business correspondence. Briefly this is: —

8 hours per week workshop practice (general);
6 hours per week technical and drawing office instruction;
4 hours per week elementary science;
10 hours per week English, mathematics, and art applied to building;
2 hours per week physical instruction.

At the end of the first year the principal advises the parents of the boys attending the school as to the most suitable vocation or craft to select for their sons; this recommendation is based upon any special aptitude shown during the first year, reports from the masters, the character of the boy, and the position of the parents." In the second and third years the courses are divided into two main sections, an artisan course and a higher course for architects, builders, and surveyors, and the development of the time table in the direction of greater specialization is shown by the fact that in the second year, in place of an eight hours a week course in workshop practice of a general kind, ten hours are devoted in the second year to specialized instruction, and fifteen in the third year. It is clear that the last year's course is hardly distinguishable at all from that of a technical institution properly so called.

Of the six trade schools or apprenticeship schools for girls in London it may be said that they provide instruction in eleven skilled trades for women. "The school hours are from nine to five, Saturdays being free. About two thirds of the school time is devoted to trade work, the remainder being given to art and general education. The trade teaching is in the hands of teachers who have obtained their knowledge of the trade in first-class business houses. As far as is possible in a classroom, workroom conditions are set up. The equipment and arrangement of the room is similar to that of a trade workroom. Workroom methods and trade standards of work are adopted, the chief difference being that, whereas in a workroom many workers may combine to produce one article, in a classroom each girl is responsible for and required to carry through all the processes of the article she makes. Very little formal work is done; as far as possible all completed work is real work made for a particular purpose. The ingenuity of the teachers is called upon to provide sufficient variety of work to provide practice and experience of the various branches of the trade which each girl must learn. A record is kept of the trade work of each girl and of the time spent in producing it."

Of the preapprenticeship type of school for boys, the Trade Preparatory School at Liverpool may be taken as an illustration. The conditions of admission are much the same as those described above for the London Trade School. "The full course of instruction is arranged to extend over two years, and occupies six hours per day on five days per week for forty-two weeks in the year. The curriculum comprises workshop practice in wood and metal; practical mathematics (including the applications of arithmetic, mensuration, algebra, etc., to workshop problems); practical drawing of simple engineering and building details, with constructive and solid geometry and hand sketching; elementary science (including laboratory work) in mechanics, physics, and chemistry; English (including composition, geography, etc.); physical exercises. The time at present allocated to each of the subjects is as follows: —

	HOURS
Workshop practice	8
Practical mathematics	5
Drawing	7
Experimental science	5
English	4
Physical exercises	1
Total	30

There is very little specialization of the work even in the second year, and there is no third year; for the boy who is willing to pursue his education further is expected to pass on to a technical school proper."

In the same class of school may be reckoned the schools of domestic science for girls which have sprung up in various towns all over England and Wales, of which the York Terrace School of Domestic Science in Liverpool may be taken as an example. (See HOUSEHOLD ARTS.) It should be added that there is a tendency to graft on to the general courses in these schools instruction in such branches of woman's work as millinery, upholstery, etc.

The ten trade or apprenticeship schools for boys in London contain 736, and the six London trade schools for girls 620 pupils. There are, as yet, no reliable statistics for the rest of the country, inasmuch as it is very difficult to disentangle the figures for the two types of school; namely, the apprenticeship type and the preapprenticeship type; but it is probable that there are at least fifty schools. These figures, both for London and the country at large, are so small as to show that even as an experiment the day school link between the elementary school and the technical school has hardly passed out of the embryonic even into the infant stage. The costliness of the schools is against them. In London of the 736 boys only 378 pay fees; of the 620 girls only 229 pay fees; and where education is not wholly free, the real measure of public appreciation is not the number of free, but of fee-paying scholars. The net cost to the rates is probably a good deal higher in the schools of the apprenticeship type than of the simpler preapprenticeship type. Thus the net cost to local rates of each girl in one of the London trade schools for 1909–1910 was £14, 18*s*. The net cost of a girl in the Liverpool York Terrace school was £4, 8*s*. 10*d*. The net cost per head of the Liverpool Boys' Preparatory Trade School was £9, 19*s*.

The trade schools echo the general complaint in England, to be heard in technical institutions of all kinds; namely, that they have not yet won the full confidence and sympathy of employers. But there is reason to believe that the position in this regard is improving partly because employers are becoming more intelligent under the spur of international competition, and partly because the schools are endeavoring more strenuously to turn out young people with the qualifications that square-headed employers are actually found to appreciate, not those that the domed foreheads of the school authorities think they ought to appreciate. It is noteworthy that, in this regard, the success of the girls' trade schools in London has been greater than that of the boys.

This day school experiment, however small, is a valuable one, but it is probable that, until a compulsory system of continuation schools is established the bulk of the real industrial education of the country will continue to be supplied by the higher classes of elementary schools, which are endeavoring to connect themselves up directly with technical institutions, and by the link between the elementary school and the technical institution furnished by the evening continuation school.

In conclusion it may be said that: First, the present situation in England is one of experiment and development. Out of the welter of discussion certain principles are emerging, and in the application of these principles there is infinite variety. But this ferment is all to the good, for it indicates the keen interestof active-minded people, above all of teachers of every grade, in new problems; and something making for the good of the people is more likely to result from the general attitude of inquiry than from any apathetic submission to this authority or that. Second, there is a growing recognition of the truth that it is impossible to have effective industrial education unless the very basis of it is real work, and work which a child or young person recognizes as useful work, such work indeed as makes him realize that he is not only an individual, but also a member of society and a citizen. J. G. L.

France. — The term "technical education" (*enseignement technique*) has been adopted in France for that education which prepares for industrial and commercial careers. The term "professional education" is sometimes used; this term, however, is too broad, and leads to confusion, since all the institutions which prepare for law, medicine, teaching, etc., are professional schools. In the organization of technical education France is far from having attained to the level of Germany, if it is true that the number of pupils in Germany who attend industrial courses can be estimated at 400,000 and that of students in commercial schools at 48,000. Great efforts are still necessary to develop a type of education on which the economic future of the country depends. It is especially in the lower grades of technical education that there is room for progress if France is not to be left behind by Germany, and if the so-called crisis in the system of apprenticeship is to be remedied. In the higher and middle or secondary grades of technical education, there is little cause to envy foreign powers. The enrollment in these institutions is 3500 pupils. To these may be added in the intermediate grade the four national professional schools at Armentières, Nantes, Vierzon, and Voiron, with 1327 pupils; the schools of watchmaking at Ouses and Besançon, with 208 pupils; and the fifteen professional schools for boys and girls at Paris with 3116 pupils.

All these institutions, maintained or supported by the State, are controlled by the Minister of Labor and Commerce. The National Conservatory of Arts and Trades was established in Paris at the close of the eighteenth century, and has been reorganized several times. It serves two purposes: it is an industrial museum displaying models and machinery, and is an educational institution. It provides free public courses, which are generally given in the evening and are intended for those who are engaged during the day. Twenty-three different courses are given in the conservatory, which may fitly be called the Sorbonne of industry. The following is a list of the courses: geometry applied to trades; mechanics; machine work; physics applied to arts; industrial electricity; weaving and spinning; civil engineering; art applied to trades; metallurgy and metal work; general chemistry in its relation to industry; agricultural and analytical chemistry; industrial chemistry; chemistry applied to coloring matters, dyeing, and bleaching; chemistry applied to limestone and cement, pottery, and glasswork; agriculture; industrial hygiene; political economy and industrial legislation; industrial economics and statistics; insurance and provident societies; commercial law; social economics; trades unions; industrial and commercial geography.

The Central School of Arts and Manufactures, established in Paris in 1828, became a national institution in 1857, for the training of engineers in all branches of industry. Foreigners are admitted on the same terms as natives. The course lasts three years. There are twenty professors. On leaving, the students receive either a certificate of attainments or a diploma of engineer in arts and manufactures. The holders of this title are much sought after for industrial positions, but have no claim to any official appointment. For government service engineers are trained at the Polytechnic School (*École polytechnique*), and the School of Bridges and Roads (*École des Ponts et Chaussées*).

National Schools of Arts and Trades (*Écoles nationales des Arts et Métiers*). — There are five of these schools (*Châlons-sur-Marne*, Aix, Angers, Lille, and Cluny). A sixth school is to be opened in Paris in 1912. Boys between fifteen and seventeen are admitted on an examination which includes written composition and oral tests in orthography, arithmetic, elementary geometry, lineal and ornamental drawing, and algebra. The schools are boarding institutions, and admit about 300 pupils. About three fourths of the pupils hold government scholarships covering tuition and board. A three years' course is given, theoretical and practical, for the industrial training of foremen, managers, capable and trained artisans.

National Professional Schools (*Écoles nationales professionelles*). — The four professional schools at Armentières, Vierzon, Voiron (established in 1881 and 1882, but opened later), and Nantes (1900) are intended for the training of artisans and foremen in industry; they also prepare for the competitive examination for admission to the National Schools of Arts and Trades. They were formerly under the Minister of Public Instruction, but by law of April 19, 1900, they were placed under the Minister of Labor and Commerce. Instruction is practical and theoretical, and is of the same character as in the watchmaking schools at Ouses and Besançon. They all have courses in iron and wood work, and also specialize in the industries of their district; thus, Armentières has spinning and weaving, Voiron, weaving and silk culture, Vierzon, pottery.

Lower Schools of Commerce and Industry (*Écoles pratiques de Commerce et d'Industrie*). — General preparatory training for industrial, commercial, and agricultural pursuits is given in the Higher Primary Schools (*Écoles Primaires Supérieures*). These offer courses of two or three years, which are based directly on the work of the elementary schools, but are not vocational in any sense. (See further detailed account under FRANCE, EDUCATION IN.) Special industrial schools based on manual work were established by the government in 1880. These *Écoles manuelles d'apprentissage* (Manual apprenticeship schools) were under the control of both the Minister of Public Instruction and the Minister of Commerce and Industry. Their aim was to impart manual dexterity and some knowledge of the science underlying the industries. The dual control (*condominium*) of this type of school proved unsatisfactory, and a reorganization took place in 1892. The manual apprenticeship schools became lower schools of commerce and industry, and were placed under the Minister of Commerce and Industry. They were intended for the training of commercial employees and artisans, and their justification was thus stated: "With few exceptions apprenticeship in a shop no longer exists to-day. It has become indispensable to put at the disposal of business men assistants who are well prepared and to supply to employers selected artisans." These schools receive pupils up to the age of fifteen. They may be established by municipalities, communes, or departments and receive state aid. In 1910 there were 66 such schools (53 for boys and 13 for girls); 36 of the boys' schools gave instruction in both commerce and industry, 16 in industry, and one in commerce alone. The girls' schools gave the combined courses. There were enrolled 10,350 boys and 2858 girls. In the industrial schools there is a course common to all, — iron and woodwork, while the other courses vary considerably according to the needs of the district, *e.g.* industrial chemistry and dyeing; wool weaving and cloth manufacture; manufacture of furniture; electricity; gunsmithing; watchmaking; cutlery; printing and typography; etc. In the commercial schools the courses are also distinguished by the local needs. Thus, the choice between two modern languages is determined by the geographical location of the school; the course in merchandise varies according to the local trade; and similarly in the vine-growing districts, the chemistry of wines is taught. In nearly all the schools there is a commercial bureau in which the pupils are made acquainted with samples of prints employed in commerce. The girls receive training to equip them for the home or for employment as artificial flower makers, modistes, corset makers, dressmakers, etc. At the conclusion of the course of three years the graduates receive the *Certificat des Études pratiques commerciales et industrielles.*

In a number of these schools there have been established normal departments which prepare teachers of industry and commerce. It is proposed to establish at Paris a normal school for industrial education.

The efforts of the State are supplemented by municipalities, chambers of commerce, communes, and individuals. In Paris the town maintains seven boys' schools for special industries; for the book industry, *l'École Estienne;* for iron and wood work, *l'École Diderot* and *l'École Dorian;* for furniture, *l'École Boulle;* for fine arts applied to industry, *l'École Bernard-Palissey;* for practical drawing, *l'École Germain-Ploin;* for the sciences applied to industry, *l'École de Physique et de Chimie.* These schools give general and industrial (theoretical and practical) courses extending over three or four years. In addition there are also eight industrial schools for girls, which prepare for the recognized trades for women, such as tailoring, millinery, flower making, fine lingerie, etc.

A number of schools may be mentioned throughout the country. Attached to the University are the Chemical Institute of Lyons; the *École de Brasserie* (School of Brewing) of Nancy; the Electrotechnic Institute of Grenoble, etc. Due to private initiative or municipal authorities are the *École La Martinière* at Lyons, celebrated for its special methods of instruction; the Industrial Institute of the North, the Spinning and Weaving School at Lille; the Technical Institute at Roubaix; the Industrial School at Tourcoing; the *École Rouvière* at Toulon, etc. The State assists about 400 technical courses with subventions.

The Schools of Hydrography should also be mentioned; of these there are sixteen, attended by candidates for the merchant marine, and the School of Forestry at Nancy and the *École de Bergerie* at Rambouillet.

As in other countries, chambers of commerce, associations of workmen and employers, and private individuals play an important part in the promotion of commercial and industrial education. Such societies for industrial training include, for example, the Society for Elementary Instruction and the Polytechnic Association (1830) and the Philotechnic Association (1848) at Paris; the Popular Education Society at Havre; the Society of the Rhone for Industrial Instruction at Lyons. Many schools of this type are distinguished from the preceding in that the pupils are received at a more mature age and are already following their occupations, while the courses of instruction tend to be more specialized. Among these schools may be mentioned "the technical schools for masons established by the Paris societies of masons and stone cutters; courses for tailors maintained by the incorporated body of tailors; schools for jewelry manufacture maintained by the jewelers' syndicate." G. C.

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INDUSTRIAL SCHOOLS, ENGLISH. — A term used in England with special reference to the schools provided for wayward, truant, and criminal children, or children of criminals and drunken parents. They include both day and boarding schools. See for detailed account the article on Reformatory Education.

INEBRIETY. — See Alcohol, the Use and Psychological Effect of; Intoxication; Temperance, Education in.

INEQUALITIES. — If a, b, and c are positive quantities, such that $a + b = c$, we say that c is greater than a, or that a is less than c. These relations are symbolically expressed thus: $c > a$, $a < c$, and these expressions are called inequalities. Inequalities are subject to some of the laws of equations, but not to all of them. For example, if $a < c$, then $a + x < c + x$; but ax is not less than cx, if x is negative. The subject of inequalities was formerly treated quite extensively in elementary algebra, and it has an interesting theory. Of late, however, it has been recognized that it is of little value until the subject of limits is reached, and therefore it has but slight treatment in our current textbooks on the algebra of the secondary school. The symbols $>$ and $<$ are due to Harriot, an English algebraist who wrote in 1631. At the same period Oughtred, another well known English algebraist, used $\sqsupset$ and $\sqsubset$ for the same purpose, and these latter symbols were used by several English writers of the seventeenth century. D. E. S.

INFANCY, THEORY OF, IN EDUCATION. — Infancy denotes, biologically, the phase of immaturity in the development of a function or organ of an organism. It is a more or less relative term, since some one function may be quite undeveloped while others are fully operative. The conception of infancy in contemporary educational theory is also colored by its legal, or better, social sense. Infancy means the period of minority, the period when an individual is legally represented by an adult and is under special protection and supervision. By a natural extension of this meaning, infancy, in education, signifies the entire period in which individuals are protected from the assumption of the full duties of adult life, especially those of economic self-support. So considered, infancy consists of those years in which children are shielded against the impact of economic conditions, in order that their time and energies may be devoted to adequate growth; in other words, the years in which the chief interest is education. Quite obviously, the biological and economic phases of infancy go together. The immaturity of capacity is the cause of economic dependence, while the period of economic dependence preserves the plasticity of organs that is favorable to continuous educational growth. Thus the conditions favorable to education have been identified with "the prolongation of infancy."

John Fiske is the author of the doctrine of the importance of prolonged infancy. He seized upon the fact that early perfection and high specialization of function are unfavorable to further development, and that they render practically impossible the acquisition of *new* powers. In some sense, the early perfection of animal instincts and powers is the barrier that precludes learning, and hence development. On the other hand, the incompetency for specialized acts of the human young means a plasticity (*q.v.*) which permits and demands learning — adaptation of capacities to new conditions as these show themselves. Consequently, infancy (of some organ) remains as long as genuine growth, transformation, is possible to a human being. Its opposite is not so much competency of action as arrest of growth, exhaustion of potentiality, of possible assumption of new directions of thought and action.

It follows that infancy is to be conceived positively, rather than negatively; it marks the presence of a powerful and significant resource rather than the mere absence of capacities. Our tendency to conceive infancy in terms of lack, deprivation, impotency, is due to our taking certain specialized adult forms of capacity as our standard; the lack and impotency are purely relative and comparative. If we emphasize the limit of growth which characterizes adult specialized powers (the fact that they evidence the formation of habits that resist readaptation), adult powers are a sign of defect as compared with the mobile, alert ease of adaptation to the new that characterizes infancy. Viewed absolutely, infancy is a power, not an impotency. It is power of growth. Viewed statically, crosswise as it were, immaturity is mere deficiency of development; and till the rise of the biological sciences and of the theory of evolution, it was almost universal to conceive childhood in this negative fashion. Children were simply partial, incomplete adults; the object of education was to hurry them through this period of lack into the full competency of adulthood. Put otherwise, education was a preparation for a future which alone was fully real and significant. But the theory of education substitutes a lengthwise view for this crosswise interpretation; it reveals immaturity as the essence of life itself, the power of continuing development, of renewal, of readaptation to the changing. It represents, so to speak, the evolutionary impetus itself, as against the fixations of capacity for adaptation indicated by matured organs.

The importance of the idea of infancy for educational purposes requires that we note the reflex influence of prolonged infancy upon the social conditions of adult life. It is hardly too much to say, as Mr. Fiske (*q.v.*) also first pointed out, that the helplessness of infancy has probably been the chief force in socializing the human race in its progress out of an animal condition. Mutual defense and economic efficiency have been powerful forces in bringing about associations of human beings. Relations of sex have brought about even more intimate and intense associations. But combinations brought about by these forces are relatively transitory and instinctive as compared with those due to the need of the continued care of the young. Although the young of savage peoples are more precocious than those of civilized races, the years in which their dependence demands continued close association are relatively long in contrast with the weeks, days, or hours during which economic and sexual needs hold people together. It is generally admitted, for example, that the change of the marriage relation from a temporary to an enduring form has been chiefly effected by the presence of children, with their long-continued need for support. And this latter motive can hardly have failed to react into industry, changing it from a predatory immediate satisfaction of physical wants as they became urgent into systematized, coöperative, and sustained modes of action. And this is only to say, with respect both to family and industry, that the presence of the dependent young has been a powerful factor in transforming instincts into conscious affections and thoughts. The continued care of children tends to change passionate attraction into tender emotions, into sympathy, into affectionate interest. It also involves foresight, planning ahead, taking into consideration matters broader and longer than the immediate satisfaction of organic appetite. An interesting light upon the education of adults through the necessities due to the presence of children is shed by the rôle which the need of instruction has played in the organization of science. Desire to get knowledge into a form in which it would be available and effective in the training of the less advanced has been an infinitely more powerful motive in bringing together and systematizing knowledge and beliefs than all purely logical motives put together. The need of education has been the chief cause of a survey of experience wider than that required by the narrow immediate personal exigencies of appetite and circumstance. This fact is illustrative of the fundamental intellectual and moral influence due to the presence of infants — that is, of the relatively helpless. In the narrower psychological sense of the term, applying to the period from birth to the end of the third year, the subject is discussed in the preceding article on INFANT EDUCATION. J. D.

See EDUCATION; GROWTH; also CHILD LABOR; CHILD PSYCHOLOGY; CHILD STUDY; CHILDHOOD, LEGISLATION FOR THE CONSERVATION OF.

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INFANT EDUCATION. — Historical Sketch. — The education of the child for the first three or four years of its life has among some people received much attention, among others very little. So also has it been in the discussion of education when education has become a matter of philosophical or social consideration.

Among primitive people there exist many customs relating both to the conduct of mother or father, and to the conduct as well as the care of the child. While most of these relate to the care of the body, many of them relate even thus early to the social education. Some of the Zuñi or Pueblo Indians even have an initiatory ceremony within three years of infancy. (See PRIMITIVE PEOPLES, EDUCATION AMONG.)

Among ancient peoples whose civilization was of a high order, the Greeks, perhaps, were most acutely conscious of the importance of utilizing the plastic period of infancy for implanting moral and æsthetic ideas and for developing a sound physique. In his *Life of Lycurgus* Plutarch tells us that the Lacedæmonians attached the greatest importance to the rearing of healthy and vigorous children. To this end the girls — future mothers of citizens — received much the same rigid physical and moral training as the boys. The Greek practices concerning infant education are discussed in the article on Greek Education; the ideals and theory are further presented in the articles on Aristotle, Plato, and Plutarch, each of whom wrote in detail upon the subject. Aristotle and Plato also devote much attention to the duties and obligations of the guardians or political officials regarding the education of infants as well as of youths.

With the Romans one finds a type of home training of infants which has become famous. The position of the wife and mother in the Roman household was one of far greater honor and dignity than that of the Greek wife. The newborn infant, far from being consigned " to the mean dwelling of a hireling nurse," was carefully reared by its own mother who divided her time between household concerns and the nurture of her children. If her cares were too onerous, some female relation of irreproachable character was placed in partial charge of the children. The Romans had a just appreciation of the value of imitation in the training of young children. In his treatise called *Brutus,* Cicero maintains that greater attention should be paid to the language which children daily hear and imitate. The fullest statement of the educational theorist is given by Quintilian. By his time (*c.* 118 A.D.) the emphasis upon intellectual pursuits and the training of the accomplished orator had become pronounced. Hence we need not be surprised to find this prince of educators and stylists not only urging that parents and nurses be cultivated persons, but taking his stand with one Chrysippus, who affirmed that no part of a child's life should be free from tuition. Even though the first three years be allowed to nurses, yet "the minds of children may be imbued with excellent instruction even by them." Quintilian concedes that probably very little can be accomplished in these early years; nevertheless "even studies have their infancy." Yet the little child should by no means be driven to intellectual tasks, but rather be led to find amusement in them.

During the Middle Ages the earliest stage of education, like all other stages, was influenced by a combination of the custom of primitive peoples of the classical civilization and by Christianity. The discussions on early Christian education, CHRISTIAN CHURCH, EARLY EDUCATION UNDER; CATECHETICAL INSTRUCTION; CHURCH SCHOOLS; MIDDLE AGES AND EDUCATION, and related topics give the details for this period. The school ordinances of the German states during the sixteenth and seventeenth centuries reveal, however, the persistence of much of the ignorance and superstition of the primitive period into that late age.

During the Renaissance and the centuries following, ideas and customs with regard to infant education very slowly and gradually underwent modification. In the seventeenth century the swaddling of infants was no longer practiced in England and Germany, although the custom persists in parts of Italy and France down to the present time, despite the vigorous protest of teachers. The nurse becomes a prominent figure in English child life in the reigns of the Tudors and the Stuarts. But the habit of sending children from home to be brought up by foster nurses never gains the foothold in England that it obtains across the channel. The faithful nurse of the Tudor period has been delightfully portrayed in Shakespeare's *Romeo and Juliet*. She it was who cared for the bodily wants of her small charges, and repeated those legendary tales, ballads, and rhymes so dear to the hearts of children. (See NURSERY RHYMES.)

For methods and materials which now began to come in vogue, especially in this early intellectual training, see the article on ABCDARIANS, NURSERY RHYMES, etc. The evil of forcing young children beyond their mental strength existed in the seventeenth century as now, although it was probably not a common practice. Sir John Evelyn, in his *Diary*, proudly writes of his infant son: "At two and a half old he could perfectly reade any of the English, Latine, French or Gothic letters, pronouncing the three first languages exactly." Apparently this infant wonder, who died when he was but just five years old, could decline Latin and French nouns, conjugate most of the regular and irregular verbs, and "had a strong passion for Greeke." Luther and Erasmus (*qq.v.*) give some consideration to the training appropriate to the very early years. But the most notable writers who consider infant education in the seventeenth century are Comenius and Locke. In his well known work, the *Great Didactic*, Comenius draws a sketch of what he calls the "Mother-School," or "School of the mother's knee." Here he quaintly describes the process by which a very little child may gradually acquire many valuable facts about its world. As the tree very early puts forth the shoots that will later become its branches, so in this first school we must implant in the future man the seeds of all knowledge. Locke (*q.v.*) is probably the first writer or theorist on education who makes the child the center of the entire process. And for this reason he stresses the physical, moral, and intellectual aspects of education. Of the three the physical is fundamental or basic, but the moral is the most important aspect. The formation of habits of good conduct, which can be begun in the period of infancy, is the chief aim of education. The intellectual aspect is secondary, and comes later.

With the middle of the eighteenth century, the result of Locke's teaching becomes apparent. In the *Émile* of Rousseau (1762) the educational importance of the period of infancy receives its first full recognition. (See ROUSSEAU, JEAN JACQUES, for details). From the writings of this reformer comes the conception of education as the development of the powers of the individual which makes the physical and psychical growth of the first few years of utmost importance. Extreme as he was in asserting that the nature of the newborn infant is wholly good "as it comes from the hands of the Author of Nature," deteriorating only in the hands of man, he performed an incalculable service in directing the attention of parents and teachers to the "primitive dispositions" of little children, and to the part these should play in determining early home education. This was an age of individualism, and Rousseau would have even the little child emancipated from an unintelligent and cramping tradition, and given his full rights as an individual. In spite of all the inconsistencies and exaggerations so frequently commented on by Rousseau's critics, no one can deny that his influence upon the course of infant nurture and education was enormous.

Pestalozzi and Froebel carried to practical embodiment the more or less theoretic suggestions of Rousseau. From his *Letters on Early Education* it would appear that Pestalozzi was as actively interested in infant education as his famous successor Froebel. He writes with the utmost earnestness that he despairs of accomplishing all that he hopes and plans for the uplifting of mankind unless the earliest stages of education be provided for. The mother, with her unfailing fount of maternal love, is the agent in whose hands lies the future of human improvement. But how is the untaught mother to direct these powers? Pestalozzi would reply: " By developing heart and brain and hands to the true standard of all activity — the spiritual nature of man." (See PESTALOZZI.) It was Froebel, however, who stands as the great organizer of the ideas and much of the practices relating to infant education. With Froebel the gospel of the sacredness and almost limitless possibilities of childhood reached its culmination. The original nature of every little child he earnestly believed to be whole and sound, since this nature was but an individual expression of the Divine Unity, of the spiritual life of God pulsating through His highest creation. Therefore every unspoiled child unconsciously and yet surely seeks that which is best. It follows that all early education should be *passive following*, not " prescriptive, categorical, interfering." The details of Froebel's ideas and practices are given under FROEBEL, FRIEDRICH, and KINDERGARTEN. In this connection account should be taken of the more superficial and mechanical scheme worked out in England under the mane of Infant Schools (*q.v.*) chiefly by Wilderspin (*q.v.*). Yet Rousseau, Pestalozzi, and Froebel were hardly more than frontiersmen in the new domain of child study, staking out the land and indicating the work to be done by their more scientific successors. The modern psychologist and educator, using the suggestions thrown out by these great pioneers, have patiently endeavored to understand, by observation and experiment, the unfolding mind of the infant. Speculation and hit-or-miss empiricism have given place to the painstaking methods of science in the study of the little child, a study upon which the earliest as well as the most advanced education must be grounded if it is to bear wholesome fruit. W. G.

Theory. — The term "education" has for so many years been identified with the formal instruction of the schoolroom that the joining of the terms " infant " and " education " seems almost a paradox. However, the present viewpoint is more and more emphasizing the fact that education is adjustment, is change, is preparation for service, the trend being always to ward ideal ends or purposes. With this emphasis on change and adjustment, no period in the child's life offers such evidences of education as do the years before he enters school, those years before his education is supposed to have commenced. If it be possible to point to any one period of four years as the one in which the greatest number of adjustments is made by the child, when he learns most, this time must surely be the period of infancy. During this interval the child passes from a being with little or no mental life to one surpassing the highest animals in intelligence, showing at least the rudiments of all the human faculties; from a helpless being that makes a few reflex and instinctive movements to one that has control of many voluntary movements which enable him to care for himself, and to manipulate objects and often people to do his pleasure; from a being whose pains are expressed by a single cry to one that experiences many human emotions and desires, capable of expressing himself in symbolic human language; from a being that merely vegetates to one that shows such potential powers that we recognize human capacities.

The importance of this period, which has been emphasized by Preyer, Fiske, Miss Shinn, and others, has been largely lost sight of during the past fifteen years, a fact due to the widespread influence of President Hall and his followers. The adolescent period has been designated as the critical one in the life of the child, hence interest in educational circles has been centering on the development of the individual during the early teens. However, the Montessori (*q.v.*) movement in Italy, and, more recently, the psychological investigations of Jung and Freud, are again focusing attention on the early infancy of the child. The results of these two investigators in psycho-analysis, although still in the tentative stages, indicate that the desires, emotions, and the mental and physical habits formed in infancy, often before the age of four years, have a very great influence in determining not only the physical status of the child, but also the future emotional and volitional life of the adult. The general trend of development and character given during these early years, even though forgotten, is, they claim, of lasting importance in shaping the final product.

Even those who regard this period as important, however, have offered few suggestions and principles for education; these few are very general and flexible in character. This lack is due to the fact that during this early life the child is in the care of his parents and physician, therefore he has not been subjected to the same close investigation as has been accorded the child of school age. The day nursery is the one institution with its chief interest in children of this age, although to the Montessori schools, wherever found, and to the *écoles maternelles* of France children are admitted at two years, and to the infant schools of England at three. Day nurseries were founded for the care of young children whose mothers were at work; the emphasis in these institutions, especially in this country, has been on the development of good health, the prevention of disease, and on educating the children through play.

The educational principles involved in infant education center around two great topics, whether applied by the mother to the training of the child in the home, or by the teachers in any of the schools mentioned, or by the nurse in the day nursery; these are: physical welfare, and the process of habit formation. Of primary importance is the physical welfare, especially during the first year, for upon health must depend not only the habits of this period, but also the intellectual development of later years. During this first year the child nearly trebles his size, a rate of growth far exceeding that of any other period, though it continues rapid for a year or two. In connection with this fact, if one realizes that the proportion of the weight of each of the vital organs to the rest of the body, and the proportion of body surface to weight greatly exceeds what it will be later, and likewise that the automatic machinery governing physiological operations is not yet running smoothly, that about 11 per cent of all children die during the first year and but 2½ per cent during the next two years, is a fact not so surprising. Recent statistics show that "a substantial reduction in the proportion of mortality has taken place even in the large cities; but it is also apparent that the decrease is more marked for children under five than for infants, — a fact which proves that the health problems of the latter have not yet received sufficient attention." This, then, is the most critical period of physical development, and all the positive measures to insure normal growth and to prevent disease should be carefully studied and provided by parents.

The factor having most to do with promoting growth and preventing disease is proper feeding. In the early months there is no food which can take the place of the natural one — milk. "Tests made in European countries have revealed the fact that breast-feeding yields the lowest infant mortality; that the use of animal milk causes a larger death-rate, and that the milk substitutes cause the largest death-rates." After the child is weaned, his food must still be fluids, and richer in albuminoids than that of the adult. The way for solid foods must be paved very gradually, for the digestive system is still highly sensitive, therefore easily upset.

Because of the larger radiating surface, and the poorly regulated heating apparatus, the infant is very susceptible to changes in temperature, so that the clothing of the child and the varying temperatures of rooms are important items in insuring good health. To expect an infant to thrive in the hot, dry air of city apartments, where even plants wither and die, is to expect the impossible. Fresh air and sunshine are more important now than at any subsequent time. The furnishings of the nursery and playroom are influential not only in determining the emotional reactions of the infant, but also in predisposing him to certain æsthetic habits, and should therefore be chosen with care.

Plenty of sleep and lack of intense and rapidly changing stimulation are necessary, as well as plenty of opportunity to exercise the muscles of the body without incurring too great fatigue. One of the most radical changes in recent years in infant education is along this line. The baby used to be considered the plaything of the family, and was always exhibited and "shown off" to guests. While awake, the child was being played with constantly, thus calling for constant change of attention. The forcing of so much violent sense stimulation upon the delicate, growing nervous organism made the baby cross and irritable, induced unnecessary and extreme fatigue, and resulted often in an overexcitable nervous system. The present view is that, though he should be played with and coddled every day, yet much of the time he should be left to himself, to play and to exercise as he pleases, without undue stimulation by adults. Other children later become his companions, and the same principle holds true for the group.

The education of the infant has as its second important factor the formation of good habits. The most important ones, perhaps, are the physiological habits, those of muscular control, — such as talking and walking, — those of perception, and certain moral habits. All education at all times in the life of any individual is conditioned by the capacity of that individual. The instinctive equipment of the infant must determine the habits that can be formed. As some instincts develop later than others, some habits must be begun after the others are well fixed. As the appearance of the instinct, however, depends not only on the stage of physical development reached by the infant, but also upon the environment, it necessarily follows that the presence of an adequate environment at the proper time is a vital factor in the normal education of a child. The formation of a habit on the basis of some instinct, on this level of development, in every case follows the same general course. Blind, uncontrolled movements are made in response to the stimuli of the environment; sometimes many; sometimes few; a proportion of them meet with partial success. The contrast between the two results, and their varying degrees of perfection, tend to develop consciousness in connection with the situation, and the movement which ended in success comes to be deliberately repeated. This repetition of the movement, with the correcting of errors and eliminating useless movements through comparison with a standard, results in a good habit. The importance of the two factors of pleasure from results, and the conscious endeavor to perfect the performance through comparison with a standard, will vary in strength and importance, the latter factor playing a more prominent part as the child grows older. The duty of the parent or teacher is: first, to see that the environment is of such a character that the instinctive reactions will show themselves; second, so to arrange things that good and useful reactions shall meet with success, and harmful or useless ones with failure; third, to make sure that all the elements which form the environment of the developing infant, especially the habits, tempers, and ideals of the adults who surround the infant, shall be of a character worthy to serve as standards toward which his growth may proceed; fourth, to bear in mind that many habits, particularly those in the intellectual and moral fields, need to be progressive, not fixed and left once for all.

In his learning at this stage the infant follows the animal method of trial and " accidental " success; the pleasure which means most to him is physical pleasure, and the pain which really deters is physical pain. Approval and disapproval have considerable influence with the child toward the end of this period, and come to be sought or avoided, at least in the beginning, according to their association with pleasurable or unpleasurable physical conditions. The only motive appealing to the infant is the individualistic one. His only aim is self-advancement and self-gratification. In all children between the ages of two and three the control of this motive is hidden by an apparent unselfishness; this is due to the inability of the child to distinguish between himself and others; his own personality has not yet been differentiated. Because he is not yet a self-conscious being, it makes little difference to him whether he or some one else has the bite or the coddling. This state does not last long, however, for at three, sometimes even before, the consciousness of self appears, and in its emergence the infant shows the individualistic motive in all its strength. To expect a child of three or four to act from any motive other than some form of self-seeking is to expect not alone what cannot happen, but a thing which would be most unfortunate if it did happen. The only method by which the social-minded, altruistic adult can be made is through having the child seek his own well-being alone, with all his heart, mind, and strength. He must learn to know and to be much, before his giving can count for much. Parents and teachers will do well to recognize that this extreme egotism of the young child is both natural and useful; it must be developed, not suppressed. The infant must be won gradually to social interests and motives. During the first three or four years of the child's life it is scarcely possible to make a beginning. In this period to train a baby to be influenced by a word of approval as well as by some reward in the way of food, to want a story instead of a toy, and to be willing to wait for rewards and pleasures instead of demanding them immediately, is to lay a good foundation for future conduct.

Regularity in the physiological processes must be established during the period of infancy. Habits of eating, sleeping, bathing, and evacuation should be fixed. The health of the infant demands at this time the establishment of such habits, and the well-being of the adult, physically and in other ways, may be largely conditioned upon them.

Muscular control comes gradually only, and is evolved from many spontaneous, uncoördinated movements; the baby, therefore, should have wide opportunity to exercise all his muscles, and clothing should not hamper his movements or interfere in the least with circulation or respiration. On a bed or a pile of rugs he can twist, wriggle, kick, swing arms, grasp at the air or anything else, and crow and gurgle, thereby preparing for future muscular control. Such control comes by degrees; first, probably, the large muscles of the arm, then " those of the eyes and head in turning toward sights and sounds, then the body in sitting, the hands in grasping, and finally, near the close of the first year, the legs in creeping, standing, and walking, and the vocal organs in repeating sounds." None of these habits is perfected in this period, but some control is gained, to be perfected and extended during the following period. The habits of walking and talking seldom come together, but a fair degree of control is attained in one, and then attention is called to the other. Walking usually precedes, but if talking is begun early, it may be delayed. Since both of these habits depend on the development of the brain centers in the third level, their appearance is some indication of the development of the nervous system. Undue delay, therefore, in the appearance of activity or in the control of either of these may be a cause for anxiety, indicating a lack of development in higher brain centers. But forcing the infant to walk before the muscles or nerves are ready is unwise, and may result in serious difficulty. After the infant has gained some measure of control of the muscles of arms and legs, he is anxious to use them, and almost any activity will satisfy him, just so he is doing something that does not involve too much fatigue. This, then, is the time to teach him to dress himself, to pick up and put away toys, and to help in many little ways; thus may be established with little effort valuable habits of orderliness and helpfulness.

The development of definite human language from the incoherent babble of the infant has always aroused the interest and wonder of the adult, but the method here followed is that one herein outlined. The babble, involving as it does all the sounds of the language, approaches at times the semblance of a word; the child is then coddled and kissed and made much of. Again and again, his process of accidental success, with subsequent pleasure, takes place, until the child finally deliberately says the word to gain the result; thus grows his control of the language, imitation of the words and accents of others coming in as aids. At first simple words play the part of whole sentences, for the normal and verbal relations do not exist independently for the young child. For him the object is always acting; for many months, therefore, the verb is neglected, and the noun takes the part of both; this is particularly true of the copula, for gesture and intonation can discharge its function. The other parts of speech appear in the following order: adjective, adverb, preposition, conjunction, and the pronoun at the beginning of the third year. In order that he may once for all learn the correct forms, it is obviously important that the child shall hear good language; this last fact bars from approbation the use of "baby talk," despite the attractiveness it possesses for the adult. Opportunities for verbal expression should be given, and situations presented where needs are satisfied only after the use of such expression. The scope as well as the character of the vocabulary of the child of three depends primarily on the need he has been made to feel for this kind of expression, and the amount of pleasure he has derived therefrom. The language habits formed before school age control for many years.

The relation between the development of language and that of ideas is a very close one; at least to some extent the latter is conditioned by the former. The intellectual life of the child at this age is largely perceptual and imaginative. He is becoming acquainted with himself, with people, with objects. From the mass of unrelated sensory impressions he must evolve unified wholes, possessing certain characteristics. The line of development of this perceptual faculty is suggested by the order of language development noted above. During this process between the third and the fourth year the confusion between the memory of percepts and the images of imagination shows itself. The percepts are still hazy, lacking many essential characteristics, and the images are extremely vivid and interesting; so arises the confusion. The need at this time is for manifold sense experiences, but with opportunity for repetition so that the percept may be fixed with enough variety not to lose the novelty. The broader and more complete the sensory and perceptual experiences of the infant, the greater the possibilities of future intellectual development. Toys afford one of the chief educational means; they should be few, simple, offering much chance for activity, thus offering stimulation for initiative and imagination. With the young child, toys should be changed often; the old ones brought back have the charm of novelty, and so stimulate to further knowledge. Suggestions afforded by the toy congress and by toy exhibits should be of great service to parents in making this stage of the child's development normal and healthful. Before he is four the child should be asking for stories; these are a very necessary part of his education, alike stimulating the imagination and giving material for the dramatic play. Stories should be chosen carefully, should be within the child's experience, yet with the wonder element prominent. Children of this age are especially interested in other children and in animals, but, whatever the content of the story, it must possess movement, color, life, in order to appeal. Stories told at this time are often the source of the night fears that trouble the majority of children. These fears are due to two factors: the child's lack of experience, which prevents his distinguishing between possible and impossible happenings, and his lack of ability to distinguish between percepts and images. If the story contains anything frightful, the baby is very apt to recall it later, after the darkness has added its mystery, making even the familiar room seem strange. He then may really believe that the bear is under the bed, or that a chance noise is the rattle of the witch's broomstick. As it is the emotional element in any situation that makes the deepest impression on the young child, the fear-producing factor may lie in the telling of the story rather than in its content. The probability of the child's developing night fears at this time is considerably reduced if from infancy he has been trained to go to sleep in the dark; on the other hand, if he is between two and three years of age before he is left in the dark to go to sleep, he will scarcely escape these night terrors, and then, if he is a sensitive, imaginative child, his suffering may be extreme. The other fears which appear in many babies, such as fear of animals, wind, etc., if they are not due to the example of adults, are usually transitory, and can be eliminated by having some definitely pleasurable result connected with the fear-arousing situation.

The period of infancy is the natural time for the establishment of the habit of obedience. It is a natural outgrowth of the relation between the infant and the adult. Obedience must first be given to a personal authority, because pleasure and good results arise from it. Punishment best understood is physical pain, and, a little later, disapproval. The adult should be consistent and moderate in his demands, but the obedience required should be immediate and cheerful. No other habit is of greater importance than this one to the future moral development of the individual. The adult's appreciation of law and his power to command find their source in this habit of obedience. Other moral habits, of self-control in emotions and desires, of cleanliness, of consideration for others, of generosity, loyalty, and truthfulness, must be begun during infancy, the motive appealed to being the same, some form of individual pleasure. The child of three or four who has found out that "it pays" to wait for things, to share with others, and to obey promptly, is in a fair way to become a social-minded, law-abiding citizen.

Briefly summarizing: infant education centers about the child's physical welfare, primarily depending on proper feeding, a wise environment including necessarily restful sleep, fresh air, a lack of undue stimulation, judicious "letting alone," and the formation of proper habits as to muscular control, the correct use of language, the regularity of the physiological functions, responsiveness to proper incentives, the development and control of desirable emotions, and the virtues of obedience and self-mastery. N. N.

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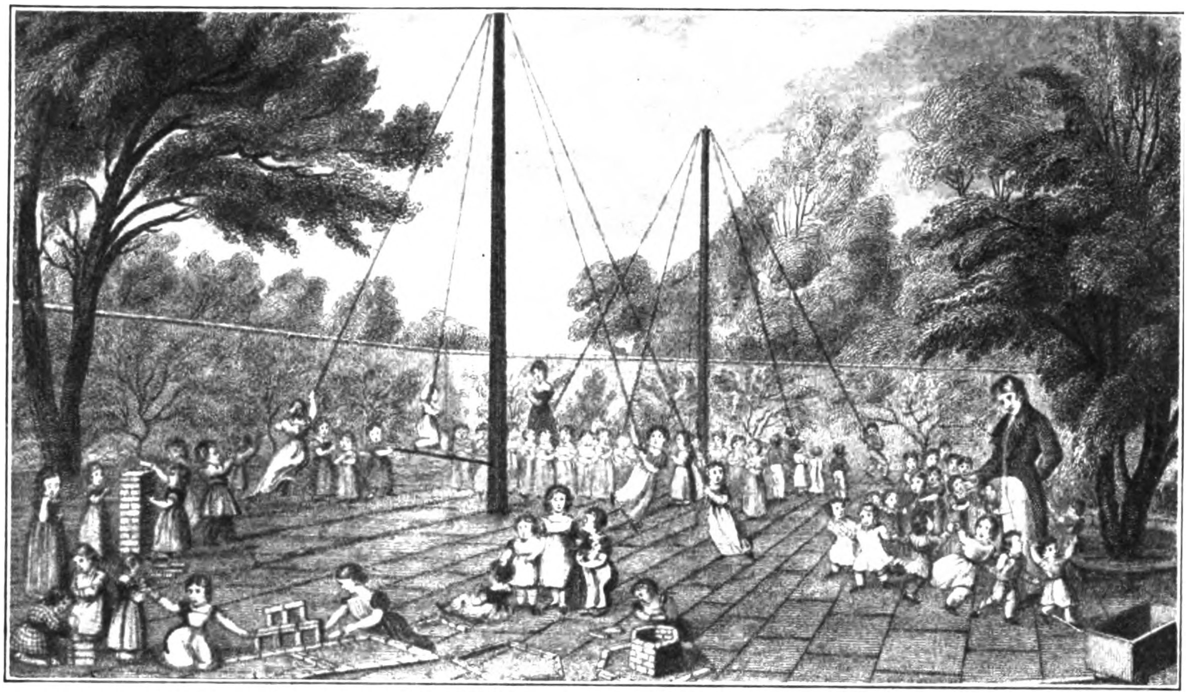
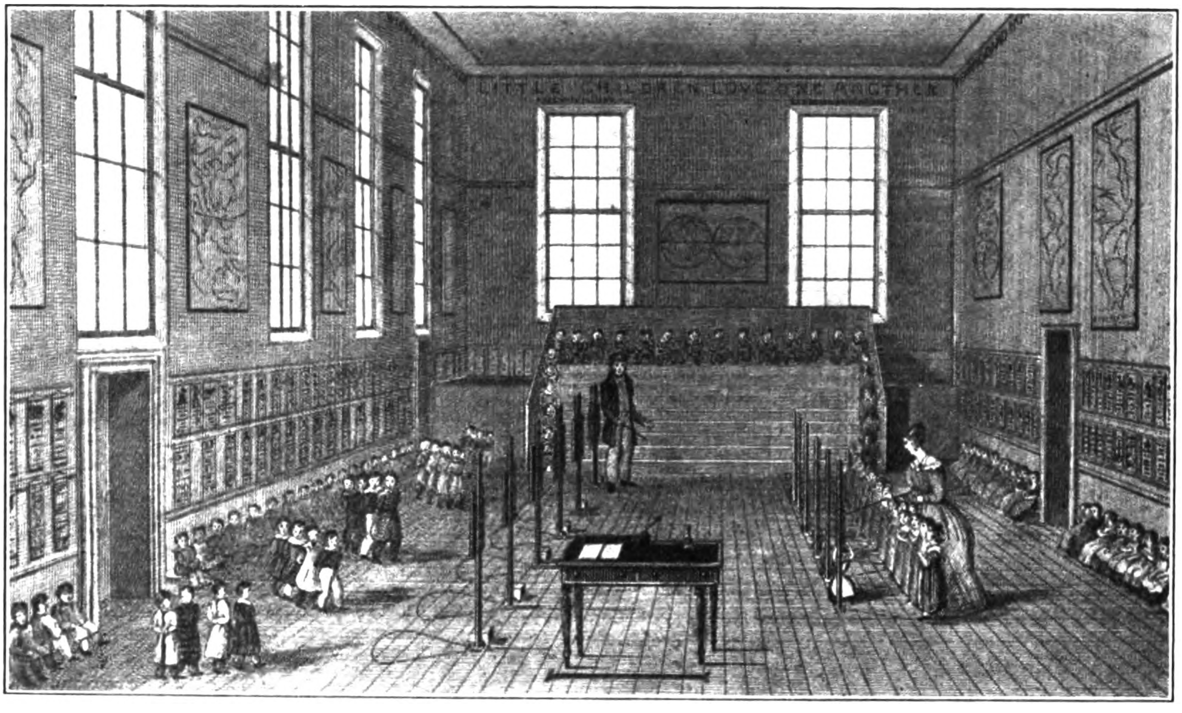
INFANT MORTALITY. — See Mortality among School Children.

INFANT SCHOOLS. — The honor of establishing the first infant school is generally ascribed to Jean-Frederic Oberlin (*q.v.*), but the institution from which sprang the infant schools of the British Islands and the *écoles maternelles* of France was established by Robert Owen (*q.v.*). As soon as Owen had obtained complete control of the cotton mills at New Lanark, "a building which may be termed the New Institution was erected in the centre of the establishment with an enclosed area before it . . . intended as a playground." The upper story was intended to serve for a senior school, lecture room, and church, the lower for an infant school. To the infant school children were admitted almost as soon as they could walk. There they were "perpetually superintended to prevent them acquiring bad habits, to give them good ones, and to form their dispositions to mutual kindness." They were taught also "whatever might be supposed useful that they could understand," and the instruction was combined with singing and dancing and as much amusement as was found requisite for health and to render the little ones active, cheerful, and happy. In fine weather they were much out of doors. There was no punishment, and "the children were not to be annoyed with books, but were to be taught the uses and nature or qualities of the common things around them by familiar conversation" and "by sensible signs — the things themselves or models or paintings." The first master was "a good obstinate dominie of the old school," but "he could not and would not attempt to adopt what he deemed to be . . . 'newfangled' ideas." Owen therefore sought among the population of the village (all depending on the mills) "two persons who had a great love for and unlimited patience with infants, and who were thoroughly tractable and willing unreservedly to follow" his instructions. He found a master in "a poor simple-hearted weaver named James Buchanan (*q.v.*), who had been previously trained by his wife to perfect submission to her will," who "loved children strongly" and had inexhaustible patience with them, and who was willing to be instructed. To aid him "a young woman about seventeen years of age, known familiarly among the villagers as Molly Young," was appointed.

The New Institution was only one of many plans for forming the younger or reforming



The Infant School at Play.


LITTLE CHILDREN LOVE ONE ANOTHER

The Infant School at Work.

the older inhabitants of New Lanark, and, Owen being skillful in attracting attention, these plans became well known both at home and abroad. The Marquis of Lansdowne, Brougham, James Mill, Zachary Macaulay, Joseph Wilson, and other benevolent Englishmen who approved of the infant school, combined in 1818 to set up a similar one at Westminster, and in order that the copy might be perfect they obtained the services of Buchanan as master. He does not seem to have had the originality or the enthusiasm necessary for working well alone, but he inspired Wilderspin (*q.v.*), who had sufficient originality to evolve a new type and sufficient enthusiasm to make it popular. Wilderspin was himself instrumental in establishing a considerable number of infant schools, and his advocacy may have had some influence in inducing the British and Foreign School Society (*q.v.*), the National Society (*q.v.*), and the Irish Commissioners to make such schools an integral part of their systems. His influence in Scotland can be plainly seen. (See STOW, DAVID.)

In 1836 the Home and Colonial Society (*q.v.*) was founded to train teachers for infant schools, and as a leading member of the Committee, Dr. Mayo, had resided for nearly three years at Yverdun, the methods of Pestalozzi were inculcated. These must have tended to correct the "bookishness" which was the chief fault of the earlier schools, for Joseph Fletcher, a government inspector who in 1845 examined the schools connected with the British and Foreign School Society, reported that a great improvement had been wrought. The improvement continued, and the Royal Commission appointed in 1858 reported that infant schools "form a most important part of the machinery required for a national system of education inasmuch as they lay the foundation, in some degree of knowledge and in a still greater degree of habits, which are essential to education, while without them a child may contract habits and sustain injuries which the best school will afterwards be unable to correct and remedy." Even then the school for infants was too much a copy of the school for older children, too much was thought of "lessons," and instruction was too often allowed to usurp the place of education. There was a gradual amendment till about 1874, when the introduction of Froebel's principles effected not a reformation but a transformation, surprising alike in its extent and its rapidity. The aims as well as the methods were changed, and the schools, though retaining their old shape, were animated by a new spirit.

France. — In the only country outside the United Kingdom where it is an integral part of the national system, the infant school may be traced back to the efforts of Mme. de Pastoret. The *salle d'hospitalité* which she founded in Paris in 1801 (see OBERLIN) does not appear to have lasted long, but when, in 1825, she heard from the Baron de Gérando, who had recently visited London, of the success of Buchanan and Wilderspin, her interest was revived and she resolved to try again. With herself as president and Mme. Millet as treasurer she formed a committee which on Apr. 1, 1826, opened in the Rue du Bac what was called a *salle d'asile.* This excited the attention of M. Cochin, the Mayor of the Twelfth Arrondissement, who persuaded Mme. Millet to go to England to study the plan. He soon followed, and in 1828 after their return the committee opened in the Rue des Martyres a *salle d'asile* on the English model. The same year M. Cochin opened another in the Rue Saint-Hippolyte which by royal command was named after him. To this was attached a normal department under the direction of Mme. Millet. In 1833 the *salle d'asile* was adopted by the government as part of the national system and M. Cochin, published a manual in which he anticipated several of the kindergarten occupations four years before Froebel had opened his first kindergarten (*q.v.*). In 1837 M. de Salvandy (*q.v.*), the Minister of Education, appointed a commission, with M. Cochin as president, to make rules for the conduct of the *salles d'asile* and to draw up a program for the *examens d'aptitude* of their mistresses. Ten years later M. de Salvandy founded in the Rue Neuve Saint-Paul a *maison provisoire d'études*, intended to complete the instruction of persons desiring to devote themselves to the direction or the inspection of *salles d'asile.* This was ultimately called the *École Pape-Carpentier*, after the distinguished lady who for twenty-seven years consecrated her talents and her zeal to its superintendence.

Benefiting by the experience of the English pioneers, the French pioneers strove to avoid the error of making the schools for infants small copies of the schools for older children. The genius of the *salle d'asile*, said Mme. Millet, was to be found in the heart of a mother; and Mme. Pape-Carpentier said that the *salles d'asile* ought to be what M. Carnot decreed in 1848 they should be called, *écoles maternelles.* The old name was resumed after a *décret* of Mar. 21, 1855. This *décret* and the consequential *règlement* fixed the curriculum and the method as well as the name. The curriculum was to include the elements of religious instruction, of reading, of writing, of mental arithmetic and of linear drawing, a knowledge of common things, suitable manual work, hymn singing, moral exercises, and physical exercises. By a *décret* of Aug. 2, 1881, which incidentally adopted once more the name *école maternelle*, the curriculum was modified. It now includes (1) the first principles of moral education; a knowledge of common objects; the elements of drawing, of reading, and of writing; exercises in the mother tongue;

notions of natural history and geography; suitable recitations; (2) manual exercises; (3) singing and graduated "synoptic" movements.

D. S—N.

See England, Education In; France, Education In.

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INFANTILE PARALYSIS. — Infantile paralysis, or epidemic poliomyelitis, is considered an infectious disease of contagious character. It is caused by a very minute organism which cannot be seen under the most powerful microscope, a germ of the kind called "ultramicroscopic." These minute parasitic bodies can pass through the pores of earthen and porcelain filters, but no difficulty is encountered in the modern laboratory in dealing with the invisible virus in an accurate manner.

The characteristic symptoms are a high temperature, pain in the back and limbs, then suddenly paralysis, generally in the muscles of the leg. The disease attacks especially children between one and five years of age, but adults are also affected. Young children are more likely to be attacked by the disease, but it is more fatal with adults. It attacks chiefly the spinal cord and the brain. The virus is always contained in the central nervous system, and may be absent from the other organs. The virus may enter the nervous system through the blood or by the lymph channels that connect the nasal mucous membrane with the membranes surrounding the brain. The infection may come through the blood by puncture of the skin by an insect, or after swallowing or inhaling the virus into the stomach or lungs, or it may come through the upper nasal mucous membrane. The nose and throat have come to be looked upon as the places where the germs are introduced into the body and expelled from the body. The virus may survive on clothing and the like, and may perhaps be carried by flies and insects.

"While the period during which patients remain infected is not accurately known, there is reason to believe that in most instances the danger is past about four weeks after the onset of the disease, and this period has been adopted as a safe average one of isolation. In exceptional cases of marked severity this period should be extended somewhat in order to provide a greater security."

There has been in this country an epidemic more or less prevalent since 1907. This is part of a pandemic which has embraced a large part of the world. The prevalence of this disease is an added reason for competent medical inspection in the public schools. It is important that the disease should be detected when it occurs among school children, and it is necessary that other pupils from the family where the case occurs should be excluded from school for a period of four weeks from the onset of the disease.

W. H. B.

See Infectious Diseases. Contagious Diseases; Paralysis.

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INFECTIOUS DISEASES. — Germ diseases, distinguished from the so-called contagious diseases only by the difference of directness in contact required for transmission. Consequently there exists no real distinction between the two groups. Besides the diseases discussed under the caption Contagious Diseases (*q.v.*), the most common school diseases, diphtheria, scarlet fever, measles, whooping cough, mumps, as well as trachoma, infantile paralysis, grippe, meningitis, typhoid fever, and tuberculosis (*qq.v.*), are discussed under separate titles. The general relation of these diseases to the schoolroom is discussed under the caption, Medical Inspection of Schools (*q.v.*). So far as their importance in the school is concerned, these diseases may be grouped into two classes. (1) Those diseases for which nearly all cities exclude children, they are: smallpox (now very rare where compulsory vaccination laws are enforced), mumps, chicken pox, pediculosis, ringworm, and scabies. Second, those diseases for which only a limited number of cities exclude children; they are: tonsilitis, tuberculosis, acute conjunctivitis, trachoma, acute coryza, favus, impetigo, and molluscum contagiosum.

All these diseases are infectious, and therefore communicable through the close contact which is inevitable in the usual activities of the schoolroom and schoolyard. Some of them, like mumps, chicken pox, smallpox, acute conjunctivitis, tonsilitis, and acute coryza, are self-limiting germ diseases requiring exclusion of infected children for a definite period. In New York City the period of exclusion for mumps and chicken pox is as follows: —

Disease	Incubation Period	Duration of Infectiousness	Period of Isolation	
	Days		Mild cases	Severe cases
Mumps	14–28	2 weeks	14 days	28 days
Chickenpox	13–19	Until the removal of the scabs 2 weeks	14 days	21 days

Exclusion of the other self-limiting infectious diseases is usually for five to ten days according to the severity of the case. (2) The parasitic diseases, such as pediculosis, ringworm, scabies, favus, impetigo, and molluscum contagiosum, are not self-limiting, but, in most cases, they respond readily to proper treatment. Exclusion from school must be supplemented with instruction to the parents for the treatment of these cases, otherwise many children affected with such diseases as pediculosis, scabies, impetigo, or ringworm would be kept out of school for indefinite periods. Two methods have been adopted in different cities for the handling of this problem. One is to have the school nurse visit the home and instruct the mother as to the proper method of treatment. The other method is to send printed directions to the parents with the notice of exclusion. In Everett, Mass., printed directions and a drug store prescription are given to children excluded for parasitic skin diseases, as follows:

Pediculosis (*Lice*). — Directions: Saturate the hair with crude petroleum. Keep it wet for three hours. Then wash the whole head with hot water and soap. Repeat this process on three successive days. Then comb the hair with a fine-toothed comb wet with vinegar. To make the treatment easier and more thorough, have the hair cut short before beginning treatment. While under treatment, keep away from the fire or a lighted lamp. Prescription: ℞ Crude Petroleum, 6 oz. M. Sig. Apply to the hair as directed.

Impetigo Contagiosa. — Directions: Wash the affected parts with warm water and soap. Apply the ointment morning and night until the disease has disappeared. Prescription: ℞ Resorcin, .15; White precipitate, .50; Adipis, q.s. 15.00. M. Sig. Apply A.M. and P.M. until disease is cured.

Ringworm. — Directions: Remove the scales with soap and warm water. Dry thoroughly and apply the medicine morning and night until disease is cured. Prescription:

℞ Tincture of Iodine, 10; Alcohol, 20. M. Sig. Apply once a day until disease has disappeared.

Scabies (*Itch*). — Directions: Take a bath with warm water and soap, scrubbing oneself thoroughly. Then dry the skin by vigorous friction, and rub into every diseased spot the ointment the prescription calls for. Continue the treatment daily until disease is cured. Prescription:

℞ Sulphur, 7.50; Beta Naphthol, 7.50; Adipis, q.s., 90. M. Sig. Apply as directed.

G. L. M.

For References see CONTAGIOUS DISEASES; HYGIENE; MEDICAL INSPECTION.

INFERENCE. — The process of thinking or reasoning, in so far as it arrives at new facts, conceptions, or truths. It is practically synonymous with going from the known to the unknown, from the uncertain to the established. In its widest use, it covers the entire process of reflection so far as that terminates in discovery. Sometimes, however, the emphasis falls so sharply on discovery that inference and proof are treated as the two antithetical functions of thinking — inference making the leap to the new, the hitherto unknown, while proof tests and validates what is inferred. As demonstrative proof and deduction are usually identified, this limited meaning identifies inference with induction (*q.v.*). J. D.

See PROOF.

INFINITESIMAL CALCULUS. — See CALCULUS.

INFORMAL METHOD. — It is frequently the case that some technical or conventional fact is taught incidentally, as it occurs in the setting of a content, rather than in the systematic relation that it bears to facts of a similar sort. Thus in the composition period, the teacher merely states to the child that good usage requires "he doesn't" instead of "he don't." No attempt is made to give the child a formal knowledge of the distinction through a complete conjugation of the verb. This attempt to keep the facts of the formal subjects, *e.g.* arithmetic, grammar, spelling, composition, closely related to their content and use, with a minimum of that distraction which would come through reference to tables, rules, inflections, or other systematic and formal treatments, is called an "informal" method of teaching. It is one species of the incidental method, but refers particularly to instruction given in formalities as occasion requires.

H. S.

See INCIDENTAL METHOD.

INFORMATION. — That phase or branch of knowledge (*q.v.*) which consists of facts and ideas that have been communicated or transmitted by others; and that are accepted, partially at least, on the credit and authority of others; that branch of learning (*q.v.*) that concerns the materials learned from other persons, orally or through books. As will be seen from the definition, information has two marks: a body of cognitive material existing irrespective of its original acquisition and utilization — a ready-made character; and dependence upon social transmission. Obviously the two traits belong together. The ready-made character of information is due to its being carried along in the social medium; while by means of the social processes of communication, facts and ideas discovered by any individual are taken up into the general body of knowledge, independently of the conditions of the original discovery.

Without the funding of personal experiences into information capable of separation from the experiences in which it originated, so that it may be acquired by others without the necessity of their repeating the original experience, every generation would be obliged to rediscover everything by its own observations and reflections — which means of course that mankind would be forever engaged in a hopeless struggle to emerge from savagery. Since language is the medium of deposit and transmission, it is natural that language as the storehouse and vehicle of information should be, upon the whole, the chief concern of schooling, and that teaching should be largely identified with the processes of purveying information. On the other hand, the attacks which educational reformers have always found it necessary to make against the domination of schooling by language give evidence of certain dangers lurking in the dependence of individual intelligence upon social acquisitions. The material, not originating in personal initiative and motivation, may easily become a foreign dead load, carried by memory, but not entering in a vital way into personal observations, thoughts, and acts. Such an external second-handed body of information is not only useless, but positively harmful. It weighs down native active tendencies, crushing them, and comes between a person and his use of his natural judgment.

There is, therefore, no problem in education more pressing than the right adaptation of information, as socially communicated knowledge, with these modes of knowledge whose achievement involves active personal response. Without the material of information, individual experience is raw, crude, narrow, untrained. But without the organic assimilation of this material, knowledge tends to be useless pedantry, or learning displayed simply for impressing others by its sheer mass. In the degree in which the body of information remains a special isolated set of facts and ideas not entering freely into everyday direct experiences, it fails wholly of its proper enlightening and directive function. It is suggestive to note that we distinguish between a person of much information and an informed person. The latter is not one who is possessed of a large bulk of second-hand knowledge, but one who is wise, posted, equipped to deal with the matters that concern him. In order that information should be really informing, it is necessary that it be communicated in connection with an active direct experience, not simply in association with other information. It is also necessary that it be applied to use in some direct activity. For example, scientific information communicated in connection with the undertaking of a laboratory inquiry so as to clarify the question at issue and to direct the experiment intelligently is much more likely to be assimilated into effective knowledge (or "wisdom") than exactly the same material conveyed as just so much matter to be learned by itself. The same may be said about the connection of, say, geographical material with the taking of excursions; there is very much important knowledge about the world that pupils cannot possibly acquire by themselves, but this transmitted material is likely to be fruitful in just the degree in which it is conveyed in connection with those activities in which pupils acquire something through their own observations and reflections. In the latter case, the two modes of knowledge blend and reënforce each other; in the former they remain in mechanical juxtaposition, and their isolation prevents the due efficiency of both. J. D.

See KNOWLEDGE.

INFORMATION TALKS. — The contemporary emphasis on individual study by children, and the use of the method of development by teachers have in great degree neglected the fact that there is a great deal of accumulated information that the child does not have to discover for himself or have taught him by the slow inductive methods of teaching. To overcome this defect, information talks are now frequently given by the teacher, the function of which is to supplement the knowledge that the child has gotten for himself in a vital but more or less fragmentary way. Such information talks do not do away with individual study or developmental teaching; they complement it. They usually follow rather than precede the more individualistic modes of teaching, the exception arising when the teacher wishes by way of preliminary to develop interest in a situation or to give a setting to the problem under consideration. These information talks are for the most part short, appearing here and there as needed in the class period. In elementary school practice they are the correlatives of the university lecture, undergoing such necessary modification and subordination that a different name is applied. In the best pedagogical sense, information talks are a sane and useful application of the lecture method. H. S.

See LECTURE METHOD; TEACHING.

INGOLSTADT, UNIVERSITY OF, BAVARIA. — An institution founded in 1472 by Duke Lewis the Rich of Upper and Lower Bavaria, on the model of the University of Vienna. The Papal Bull of Pius II authorizing the establishment of the university was dated 1459, but instruction was not actually begun until thirteen years later. The institution consisted of four faculties, of which the faculty of philosophy early assumed the chief importance. During the Reformation Ingolstadt sided with the Catholic party, one of the most prominent members of the teaching staff being Johann von Eck, who replied to Martin Luther's ninety-five theses, thereby paving the way for the Leipzig disputation between himself and Luther in 1519. At the close of the sixteenth century the university attracted a large number of students, Jesuit influences being paramount from the middle of the sixteenth to the eighteenth century, *i.e.* to the suppression of the Jesuit order in 1772. The foundation for the present faculty of political science (University of Munich) was laid in 1799 by the establishment of an institute of cameralistics, which comprised a series of subjects from the fields of jurisprudence, natural science, political economy, statistics, technology, agriculture, and forestry. In due course of time technology and agriculture were transferred to the technical school at Munich, but the subject of forestry is to this day included in the faculty of political science of the University of Munich. In 1800 the university was transferred to the city of Landshut, and from there to Munich (*q.v.*) twenty-six years later. Ingolstadt is also the seat of the first Jesuit college founded in Germany (1555).

R. T. Jr.

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INHIBITION. — A term applied to two groups of phenomena: the one psychological, the other physiological. Psychological inhibition consists in the conflict of parts of the content of consciousness, and the partial or total suppression of one by another. Awareness of pain, for example, may be inhibited by other sensations. The soldier frequently suffers severe wounds of which he remains unconscious because of the inhibiting influence of emotional experience. In the hypnotic state one of the most obvious phenomena is the inhibition of certain kinds of consciousness by others which, perhaps, have been suggested by the hypnotizer.

Physiological inhibition consists in the partial or total suppression of one physiological process by another or others. The phenomenon is best known in connection with the functioning of the nervous system. There are certain specifically inhibitory nerves, as for example the vagus, whose function is the regulation of certain organic processes by suppression or depression. The activity of the heart may be inhibited by stimulation of the vagus. But the cases of inhibition which result from the functioning of inhibitory nerves or centers, if such exist, are few and unimportant in comparison with those which appear to be due to the conflict or competition of impulses within the nervous system. The appropriate reflex of the leg of the frog to stimulation of the foot may often be inhibited by simultaneous stimulation of the other leg. As Sherrington says, "the most striking thing that we know of inhibition is that it is a phenomenon in which an agent, such as in most cases excites or increases an action going on, in this case stops or diminishes an action going on." R. M. Y.

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INITIATIVE. — A term denoting originality and independent force as factors to be maintained and secured in education. Initiative is etymologically connected with the word "initial"; namely, something at the beginning or outset. It thus refers to ability to originate, to undertake independently, some desired line of action. It is opposed to mere docility, passiveness, imitativeness, and other conceptions that denote dependence upon others in entering upon a new course of action. The demand for initiative as an indispensable part of the educational aim is coincident practically with the growth of democracy (*q.v.*). In a feudalistic society personal initiative is undesired with respect to the masses of men; what is wanted is that they should readily subordinate themselves to the carrying out of the demands and ideas of others. The proper adjustment of the personal initiative required by a democracy on its social and political sides to the conditions of industrial employment and wage-earning involved in the capitalistic régime is a problem still to be solved, or even seriously considered, yet it is the heart of the question of industrial education. J. D.

See ACTIVITY; INDIVIDUALITY; FREEDOM.

INJURED, FIRST AID TO. — Instruction in first aid as it is ordinarily given is of value because of its health-preserving or life-saving possibilities. But in addition to this utilitarian quality, such instruction in the hands of the well-informed and skillful teacher may be given intellectual and scientific qualities. All rational first-aid treatment is based on a scientific knowledge of the relation between anatomical structure and physiological function, and between pathological cause and morbid effect. These relationships are most easily and successfully brought out in those courses where instruction in first aid is made an essential part of a general scheme made up of instruction in hygiene and physiology. Instruction in first aid may then easily be educational as well as utilitarian. It is, however, chiefly and most seriously valuable because of its utility.

In planning a course of instruction in first aid the teacher must take into account the maturity of his pupils. It is obviously useless as well as dangerous, to instruct young children in the use of poisonous antiseptics, and then expect them to make any practical use of the knowledge they may have gained through such instruction.

Another important consideration is the applicability of the instruction given to the daily affairs of the individual who is receiving the instruction.

Instruction in first aid should always be graphically illustrated and demonstrated in every practicable way. In addition, the individual receiving such instruction will profit a great deal more, if he is permitted to do under supervision the minutest details of what he is being taught. The application of simple bandages, the construction of a sling, the technique of resuscitation of the partially drowned are samples of procedures that each member of the class should be required to do step by step under careful supervision. In other words, the teacher of first aid will do well to employ appropriately the various practical educational methods which he finds advantageous in his other classroom or laboratory instruction.

Instruction in first aid should emphasize the need for medical help in appropriate cases. Serious consequences may be avoided, if the non-medical attendant is not so sure of his own ability as to neglect to call in expert help.

Scope of Instruction. — The scope of a course in first aid should include instruction concerning preventive and protective measures, emergency treatment, and emergency prophylactic treatment appropriate to the maturity, intelligence, and education of the individuals under instruction and applicable to the conditions under which they are most likely to have practical use for such instruction.

Preventive and Protective. — Instruction in swimming, diving, rescue, and resuscitation manœuvres; management of the rowboat and canoe; danger of the undertow, seapuss, waves, breakers and waves in the wake of the passing steamer; the avoidance of street accidents from automobiles, street cars, trucks, railway trains, etc.; the avoidance of injury from lightning and electricity; the transportation of the injured; the handling of firearms; the handling, labeling, and storing of combustibles and explosives; the management of small fires; what to do in case of fire; how to smother burning clothing; escape from suffocation in burning buildings; escape from burning buildings; poisons, their handling, labeling, and storage; avoidance of frost bite, freezing, heat exhaustion and sunstroke; avoidance, particularly by children, of exposure to injury from maddened animals; protective measures in appropriate countries against poisonous insects, snakes, plants, and fruits.

Emergency Treatment. — Hemorrhage from the limbs, trunk, head, nose, stomach, intestines, or urethra. Simple and compound fractures of the legs, thigh, ribs, collar bone, toes, fingers, forearm, upper arm, and skull. Sprains and dislocations of the ankle, knee, hip, sacro-iliac joint, fingers, wrist, elbow, or shoulder. Poisoning with the various common acids, alkalies, and poisonous domestic preparations. Foreign bodies in the skin (splinters), the eye, ear, nose, throat, stomach, and trachea. Burning clothing; active acid and alkali burns. Fainting, shock, epilepsy, apoplexy, hysteria, convulsions, and delirium. Pain in the head, ear, face, teeth, chest, abdomen, groin, muscles, bones, and joints. Hiccough, nausea, vomiting and diarrhea, croup, asthmatic attacks, and other sudden evidences of obstructed breathing.

Emergency Prophylactic Treatment. — Instruction here should include, first, a discussion of the serious value of early treatment for the avoidance of later infection. This instruction should further include aseptic and antiseptic treatment, simple dressings, bandages, the cleansing of wounds, the approximation of the edges of gaping wounds, special care of superficial and deep wounds of the skin and scalp; special prophylactic treatment of powder burns and Fourth of July accidents; special treatment of other burns; special treatment of wounds of the eye, ear, nose, lips, and mouth.

T. A. S.

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INNATE IDEA. — The rationalistic school has always attributed to thought or reason a certain inherent content of its own, irrespective of the processes of experience. It has insisted that without this original equipment experience itself would be a floating, unorganized mass of particulars, incapable of delivering any general or scientific knowledge. The particular mode in which this inherent endowment was conceived varied from time to time according to conditions. In the seventeenth century the supposed rational stock was quite commonly spoken of as ideas or conceptions which the individual immaterial soul brought with it to its union with the body as inborn ideas. In the interests of empiricism, Locke attacked this whole theory, contending that none of the tests relied upon by the innate school bore out their contention; that the origin of all ideas could be traced in experience itself, and that the belief in innateness, instead of being favorable to the advance of science, tended to block inquiry by consecrating as unquestionable principles any long-standing prejudice, especially if class interests were concerned in its maintenance. Locke's onslaught was substantially successful against the doctrine which he attacked. But, as Locke himself held to certain innate powers (such as comparing, combining, discerning, abstracting) of the mind, it was not difficult for the rationalistic school to regather its forces. The modified form of the conception found its classical expression in Kant, who, denying the existence of ideas, or mental contents, conceptions, beliefs, prior to sense experience, nevertheless held that the mind brought with it certain *a priori* forms and categories to the reception and organization of the materials of sense. The universal and necessary action of these *a priori* forms alone made experience capable of delivering coherent and instructive judgments. J. D

See Intuition.

INNER MISSION. — See Wichern, J. H.

INNERVATION. — The process of sending a nervous impulse out from the central nervous system.

See Nervous System.

INNS OF COURT, LONDON. — Originally these were the Hostels or Inns in which lived the apprentices, who belonged to the Gild of Law, the residence of those studying under the Masters of Law. The earliest of such Inns is said to be that of Clifford's Inn, which in 1344 was established in a demise from Lady Clifford to the lawyers of the Court of Common Pleas. Thavies Inn seems to have been established in 1348. The origin of these Inns is apparently connected with the exclusion of the clergy from practicing as lawyers in the civil courts, and the necessary consequence of training of lay lawyers. In the first instance, senior members of the gilds of law teachers and learners of law established their own voluntary classes and small residential Inns, in considerable numbers. The number of such students gradually increased, until, as Dugdale says, they divided themselves into two bodies, *e.g.* the Society of the Inner Temple and that of the Middle Temple. The Inner Temple is first mentioned in 1440 and the Middle Temple in 1442. About the year 1470, Sir John Fortescue wrote his *De Laudibus Legum Angliæ*, in which he states that there were four Inns of Court, and ten lesser Inns called Inns of Chancery, "in each of which there are an hundred students at the least, and in some of them, a far greater number, though not constantly residing. . . . After they have made some progress here, and are more advanced in years, they are admitted into the Inns of Court, properly so-called; of these there are four in number." They were Lincoln's Inn, the Inner Temple, the Middle Temple, Gray's Inn. "In these greater Inns," Fortescue continues, "a student cannot be well maintained under eight and twenty pounds a year (£450 a year of our money); and, if he have a servant to wait on him (as for the most part they have), the expense is proportionally more. . . . As to the merchants, they seldom care to lessen their stock in trade by being at such large yearly expenses. So that there is scarce to be found, throughout the kingdom, an eminent lawyer, who is not a gentleman by birth and fortune; consequently they have a greater regard for their character and honour than those who are bred in another way."

With regard to the education of the students, Fortescue gives the following interesting account: "There is both in the Inns of Court and the Inns of Chancery, a sort of Academy or Gymnasium, fit for persons of their station; where they learn singing, and all kinds of music, dancing, and such other accomplishments and diversions (which are called Revels) as are suitable to their quality, and such as are usually practiced at Court. At other times out of term, the greater part apply themselves to the study of the law. Upon festival days, and after the offices of the Church are over, they employ themselves in the study of sacred and profane history: here everything which is good and virtuous is to be learned: all vice is discouraged and banished. So that knights, barons, and the greatest nobility of the kingdom often place their children in these Inns of Court; not so much to make the laws their study, much less to live by the profession (having large patrimonies of their own), but to form their manners and to preserve them from the contagion of vice. . . . Neither at Orleans, where both the Canon and Civil Laws are professed and studied, and whither students resort from all parts; neither at Angiers, Caen, nor any other University in France (Paris excepted), are there so many students, who have passed their minority, as in our Inns of Court, where the natives only are admitted."

Fortescue devotes a chapter to answering the question why the laws of England are not (in 1470) taught in the universities, and his answer is that in the universities "the sciences are taught only in the Latin tongue, whereas the Laws of England are written, and made up of, three several languages, English, French and Latin." He mentions that the English "to this very day" speak French in their diversions and their accounts. "In the Courts of law, they formerly used to plead in French, nor had the practice entirely fallen out, (1) by reason of certain law terms, more apt in French than in English, (2) Declarations upon Original Writs are learned and practised in French, (3) Reports of pleadings etc., in the King's Courts are digested and reported in French; (4) Many Acts of Parliament are penned in French."

The advantage of studying in the Inns of Court, as against the universities, is further emphasized by proximity to the Courts of Law, where students may hear proceedings and listen to the judges and thus become experienced in all sorts of law learning and court practice at the same time. Mr. C. E. A. Bedwell says it is difficult to define the status of the Inns of Chancery in their earliest days, but by the time of Fortescue the relationship of each one to the Inn of Court to which it was attached approached to that of a college to its university.

The Inns of Chancery ceased to exist with the sale of Clifford's Inn in 1900. Stow says the Inns of Court were replenished with young students, graduates, and practicers of the law, whilst the Inns of Chancery were furnished with officers, attorneys, solicitors, and clerks that follow the courts of King's Bench or Common Pleas. Stow mentions that young students from the universities and some straight from grammar schools came both to the Inns of Chancery and the "houses of Court," and having spent time in studying the first elements and grounds of the law, they performed (before admittance as barristers), the "exercises" of their own houses, called "bolts" and "moots" — the course taking seven years — the same length of time as apprentices in business.

Educationally, the "boltings" and "moots" are interesting, and represent to law what laboratory work is to science teaching. The "boltings" were thus the "sifting" of the law with regard to cases, in which "an ancient and two barristers sit as judges, three students bring each a case, out of which the judges choose one to be argued, which done the students first argue it, and after them, the barristers." This exercise, being a private one, was regarded as inferior to the "moot," which was substantially the same kind of arguing of cases by the students to enable them to see every point of a case, but was a public exercise. The place chosen for the exercise was called the Moot-Hall. The Inns of Court appointed a bailiff of the moot, who chose the mootmen for the Inns of Chancery, and whose duty it was to "keep accounts of the performances of the exercises both there and in the house." For account of the exercises in the different Inns, see Sir Wm. Dugdale's *Origines Juridiciales* (1666–1680). J. E. G. DE M.

See LAW, EDUCATION FOR THE, for an account of the present practice.

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INNSBRUCK, THE IMPERIAL ROYAL LEOPOLD-FRANCIS UNIVERSITY OF. — The University of Innsbruck in the Tyrolese Mountains, Austria, was established by Emperor Leopold I between 1670 and 1674, the charter dating from the year 1677. The Emperor Joseph II transformed it into a lyceum in 1782, but it was restored to university rank ten years later by Leopold II. In 1810 the institution was abolished by the Bavarian government, but in 1826 it once more opened its doors under Austrian protection with faculties of law and philosophy. In 1857 a theological faculty (Catholic) was added, and twelve years later a medical faculty. The university library owes its origin to a collection founded in 1745 by the Empress Maria Theresa, various collections of dissolved Jesuit colleges having been added later. The attempts made in 1904 to organize in Innsbruck a faculty of law and political science, in which instruction was to be given in the Italian language, met with failure. The University had 1227 students (fifty-one women, all auditors) in the winter semester of 1909–1910, of whom 225 were auditors. The largest faculty, contrary to the condition existing in all other German and Austrian universities, is that of theology (337 students), controlled by the Jesuits, which is followed by law (266), medicine (213), and philosophy (186).

R. T., Jr.

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INSANITY. — A term for a number of abnormal mental states, which are combined into complexes to make up distinct diseases. The usual statement that insanity is a mental disease or that it is an absence of sanity does not define, because we must then state what we mean by mental health or by sanity. The general term may be compared with that applied to any organ of the body, *e.g.* liver disease, heart disease, etc., and we find that the connotations of such terms are equally vague. We, therefore, speak more properly of the insanities than of insanity. The variety of forms that are grouped under the general term "insanity" will be considered below.

When the varying phenomena of the insane are grouped, it is found that the differentiation of insanity from sanity is made from two points of view: the duration of the abnormal mental conditions and the variation of the present conditions from the normal conditions of the individual. The best definition of the term is as follows: "Insanity is a disorder of the mind, due to disease of the brain, manifesting itself by a more or less prolonged departure from the individual's usual manner of thinking, feeling, and acting, and resulting in a lessened capacity for adaptation to the environment" (White). It will be seen that this definition excludes all the abnormal individuals who from birth depart from the normal in a mental way, *i.e.* all the cases of retardation, including idiocy, imbecility, and psychopathic inferiority, for their condition is continuous and not a departure from the usual manner of their thinking, feeling, and acting. On the other hand, there are excluded the temporary departures from the normal, such as slight intoxications, profound grief, fits of anger, etc. The ethical and legal aspects, so often taken as the main criteria, of knowledge of right and wrong are not considered, because these vary in the insanities as much as in normal conditions.

Perhaps of the greatest importance is the factor of the individual variation, *i.e.* the variation of the individual from his usual manner of feeling, thinking, and acting. In themselves the individual mental states may be greater or less than those of the other individuals in the environment without warranting the conclusion of "insanity." The example of the savage transported to a civilized country makes this clear. In an educated person actions similar to those of the savage are taken as signs of an insane state.

Psychologically considered, the abnormalities of the insane are only different in degree from normal mental functions. So far as the abnormal mental conditions have been analyzed, no qualitative difference from the normal has been discovered. The insanity is always a difference in the amount or the prominence of this or that mental state or states, and not a difference in the quality of the mental states. No new functions are introduced, and there are no new qualities of normal mental processes developed in the insane. Another popular misconception is that the term "insanity" is almost synonymous with the term "delusion," that all insane persons are egocentric, fantastic, abnormally excitable, or expansive. The quiet gentleman whom I meet daily has none of the latter qualities, but he is incapable of adaptation to the environment because he can perform no work that the spirits do not approve, and he is often hindered by the action of the spirits.

In civilized communities the proportion of insanity to the total population is almost a constant, 1 : 300. The initial symptoms are often noticed before the age of twenty, but the disturbances do not usually become sufficiently profound to warrant or to require institutional care for a number of years.

There are both physical and mental causes for the insanities. Head injuries, chronic and exhausting diseases, and various intoxications (*q.v.*) are some of the bodily causes, and on the mental side any great shock, mental stress, or worry may bring about a more or less permanent derangement of the mind. The mental factors have recently been given more prominence than hitherto, and many of the patients who were previously supposed to be insane from physical causes are now recognized as purely psychogenic cases.

The early classifications of the insanities were largely symptomatic, and can be compared directly with the classification of the fevers into hot and cold, intermittent, remittent, and continuous. On the other hand, classifications have been devised to indicate the probable causes of the conditions, and we find mentioned the insanities of childbirth, of puberty, of the climacteric, of religion, and many others. The current classifications of the insanities are either that of Kraepelin or modifications of the Kraepelinian. This author introduced into the consideration of the insanities a new conception, viz., that the different forms were to be differentiated not because of the prominence of some symptom and not because the patient or his relatives assigned some cause, but because of the characteristics of the condition from the beginning to the end. In other words, Kraepelin takes into account causes, course, or development, and the final result. The following classification is a convenient one: paranoia and paranoid states, manic-depressive insanity, paresis, dementia precox, melancholia, involution, senile psychoses, infection-exhaustion psychoses, toxic psychoses, psychoneuroses, psychoses due to organic disease and injuries of brain (*qq.v.*).

The infection-exhaustion psychoses are similar to the toxic psychoses, in that confusion and delirium are usually the prominent symptoms. All of these psychoses are probably due to the presence in the blood of toxins that act upon the nervous structures in much the same way as those introduced from without, such as alcohol, opium and its derivatives, cocaine, etc. The infection-exhaustion psychoses may be divided into (*a*) infection, (*b*) delirium, (*c*) febrile delirium, (*d*) post-febrile psychoses, and (*e*) collapse psychoses. All forms have clouding of consciousness, a greater or less amount of confusion, hallucinations and delusions, and for months these symptoms may alternate with normal mental states. In the most severe states stupor is found. The senile psychoses are of little interest here, except in so far as they are associated with rather definite mental disturbances of memory. The term "second childhood" describes only some of the senile insane, and from the educational point of view these are of interest in that they enable us to make certain analyses of forgetting and of memory loss. In many cases we find hallucinations, delusions, depressions, exaltations, and on the physical side epileptic and apoplectic attacks. Mental derangements are also sometimes found associated with brain disease or injury. These patients differ greatly in their symptoms, but all may be briefly described as "demented." The injury effects often give a means of diagnosis of the part of the brain which has been injured, and a cure is sometimes produced by appropriate surgical intervention. Aphasia is sometimes associated with these psychoses, and it often simulates a profound dementia.

Although insanity was defined as a "disorder of mind due to disease of the brain," we are still completely at a loss to correlate certain mental diseases with brain changes. In the manic-depressive psychoses, in paranoia, in dementia precox, and in the psychoneuroses no typical cerebral alterations have been found. These conditions are, therefore, sometimes called "functional" in contradistinction to the "structural" diseases, such as paresis, the senile psychoses, and the insanities due to disease and injury of the brain. In paresis the nerve cells are found to be greatly degenerated, and the cerebral cortex is found to have many abnormal elements, due to the disintegration of the cells or to the development of the non-nervous elements. The greatest changes are said to be found in the frontal and posterior association areas. In the senile insanities there is found atrophy of the brain, so that the convolutions are shrunken, and small or large areas of softening (or disintegration) are often found associated with occlusion of the arteries. The changes in the cortical cells differ from those in paresis, although both are retrograde and destructive. The pathology of the psychoses due to brain disease or injury differs in accordance with the part of the brain injured. In dementia precox changes in the structure of the cortex have been observed, but it is not certain that these are typical of the disease.

It will be noted that all the developmental defects, idiocy, imbecility, and other forms of retardation, have been omitted from the discussion of insanity. As was noted above, these are not forms of insanity, but defects or lacks of development, and are to be treated in separate articles. S. I. F.

See Idiocy.

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INSISTENT IDEAS. — See Fixed Ideas.

INSOMNIA. — Abnormal wakefulness or loss of sleep. The condition is the opposite of narcolepsy (*q.v.*). Insomnia may be total or partial, and may continue only one day, or for long periods. The varieties of insomnia are numerous, those most frequent being the conditions in which the individual goes to sleep at the normal time, but wakes up soon and remains sleepless the remainder of the night, and those in which the individual finds it difficult to go to sleep and lies awake for hours, tossing about until exhaustion overcomes him and sleep ensues. In both cases the amount of sleep may be normal, but the going to sleep and staying asleep are abnormal. These two kinds of insomnia are often due to bad habits of sleep, and not to any pathological nervous condition of the individual. Losses of amounts of sleep are common in many nervous and mental diseases, especially in the cases of excitements, *e.g.* in mania and in disturbed dementia precox. In the insane and in mentally normal people who suffer great pain the amount of sleep may be greatly reduced, and the patient sleep little, if at all, for several days. It is usual to find, however, that individuals complain of sleeplessness even when they have had a normal quantity of sleep; and one should hesitate to accept the individual's opinion regarding the amount and character of his sleep.

The effects of loss of sleep are much greater than those of the losses of food, and the effects are found to be mentally effective as well as physically. On the physical side there are loss of body weight, changes in the temperature of the body, and reflex nervous phenomena. A few days' loss of sleep will produce a delirium, a condition that would not follow starvation for five or six times the number of days.

On the mental side slight or continued loss of sleep is accompanied by inability to fix the attention, memory defects from inattention, and feelings of lassitude. When children exhibit these symptoms even to a mild degree, it is important to inquire regarding the amount and character of the sleep, for some cases of retardation are due to bad family surroundings that prevent the child having a sufficient amount of sleep.

Most of the cases of insomnia are due to bad habits, and must be treated as such. If the sleeplessness be due to concomitant pathological conditions of the body, the latter must be treated, and the insomnia will disappear. It should be remembered, however, that bad habits are formed here as well as for other bodily and mental activities, and it is not uncommon to find that the habit of sleeplessness is formed by only a few days' illness. Sleeplessness may also be due to imaginary causes, and it is most easy to produce a sleepless night by calling the attention of one who has taken coffee to the fact that this beverage is a stimulant and will produce wakefulness. On the other hand, it is equally easy at times to produce sleepiness by calling attention to monotonous sounds and by recommending innocuous drug-like prescriptions. S. I. F.

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INSPECTION OF SCHOOLS. — Some system of school control through inspection has always existed, since the time when education was in the hands of the Church and teachers were licensed by the *scholasticus* or the chancellor, to the modern period when the State has taken over the charge and maintenance of schools. For the medieval period see BISHOPS' SCHOOLS; CHURCH SCHOOLS; CHANCELLOR; SCHOLASTICUS; VISITATIONS. During the Reformation period immediate inspection and visitation of schools was exercised by the local pastor, and consisted usually in an examination of pupils and teachers. The earliest system of state inspection was probably introduced at Gotha (*q.v.*) under Ernest the Pious (*q.v.*). Inspection by official inspectors of the State was introduced on a large scale when the State began to supply funds for the maintenance of schools. Thus in England the first government inspectors were appointed in 1839, when a grant was made in aid of school buildings. Inspectors who visited Church of England schools had to be approved by the Archbishop. The first instructions were issued in 1840, and required the inspectors to report on the number of schools in their districts and the state of education there, to inspect aided schools, and to recommend the appointment of teachers. These remained essentially the duties of inspectors for many years. After 1861, when payment by results was introduced into elementary education, the inspectors began to examine the pupils, and this system left its mark on English inspection. The large majority of inspectors were professionally untrained, although from 1879 a number of schoolmasters were appointed as assistant inspectors. Administrative duties, such as the examination of registers, time-table, and log-books, continued. The broader function of supervising instruction and the teaching process, and in this way assisting the teachers, is only gradually being recognized as of primary importance. No special professional qualifications are yet demanded from those who are appointed to inspectorships; as long ago as 1879 Mr. Rathbone moved in the House of Commons that "before being appointed to an independent post, newly appointed inspectors should have one year's training under an experienced inspector, unless they have previously been engaged in the education of children for a sufficient time to make this unnecessary." The great need of the present, however, is a requirement of professional training and experience as a necessary qualification for appointment, if the inspecting staff is to secure the confidence and professional support of teachers. Special inspectors are also employed for art, domestic subjects, drawing and handicrafts, rural education and agriculture, music, and the training of teachers. The employment of local inspectors, in most cases teachers of experience, by local authorities is increasing rapidly. Since 1899 the Board of Education has undertaken to inspect secondary schools on request, while all schools which desire to qualify for the state grant must submit to an inspection of both instruction and premises.

See SUPERVISION OF TEACHING; SUPERVISION, PRINCIPLES OF; also ACCREDITED SCHOOLS; ENGLAND, EDUCATION IN; FRANCE, EDUCATION IN; GERMANY, EDUCATION IN.

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INSPECTORS, STATE. — See SUPERVISORS; HIGH SCHOOLS, STATE SYSTEMS OF.

INSTINCT. — Use of Term. — Modern writers have not agreed upon a fixed meaning of the term "instinct." The field of instinct is the common ground of both psychologists and biologists. The experimental biologists take an objective viewpoint with respect to instinct. For them, instinct is a combination of congenital responses, unfolding themselves serially under appropriate stimulation: the series as a whole being generally but not necessarily adaptive in character (always so from a Darwinian standpoint). Each unit reaction or element in this series may be looked upon as a "reflex." An instinct is thus a concatenated series of reflexes. Such a series of reflexes, or an instinct, is illustrated by the first attempts at nest building of young birds, by the first fighting responses in young animals of any kind, and by the capturing, killing, and eating of prey (as appears in kittens), etc. The combination must be observed on its first appearance if it is to be seen "pure," *i.e.* without the presence of the habit-factor.

Reflex. — If this definition of instinct is to be acceptable to the animal psychologists, it is necessary to add that the term "reflex" (including tropisms under this head) should not be understood to mean an absolutely fixed and unalterable type of response. Jennings, Mast, Yerkes, and many other American writers have shown that the responses even of the protozoa and of the lower metazoa are not reflex in the sense of being fixed and stereotyped. Two factors determine the overt observable response: the extra-organic stimulation (sensory stimulus) and the intra-organic processes (physiological states). If either set changes, the overt response changes, either greatly or little; *e.g.* the stentor may react in several different ways or in the same way, but more or less intensely, to the same (extra-organic) stimulus, provided the physiological state of the animal be different at different moments of stimulation. Yerkes has shown that the amount of the reflex movement of the leg of the frog called forth by an electric stimulus can be greatly increased by introducing an auditory stimulus simultaneously with the electric stimulus, although the auditory stimulus calls forth no visible response when given alone. As the interval between the auditory and the tactual is gradually increased, the reënforcement of the reflex response gradually decreases, and finally gives place to an actual inhibition. Similar conditions hold in the case of the human knee jerk and other reflex-like phenomena.

In general terms, then, while the reflex is the simplest type of organic response, calling on the structural side for the presence merely of an open pathway from receptor to effector (or from sensory surface to muscular mass when the nervous system is lacking), at the same time many influences, as has been well brought out by Sherrington, are at work, or may be at work, to alter the perviousness of this pathway (blockage on the reverse at the synapses, momentary or more lasting differences in tonicity of the musculature, etc.), and thus to alter the intensity, and to some extent, even the character of the so-called "simple reflex" responses. "Simple reflex," then, is a mere concept — a general term to cover segmental reactions which appear at first sight to be relatively simple in character. If the individual units composing the series of responses which are grouped together to give us the total picture of an instinct in action are variable in their function, then the series as a whole must necessarily offer still greater possibilities of variation. If the above contention for the variable character of the simple reflex is granted, the biological or objective definition of instinct is acceptable.

Presence of Consciousness. — The older psychologists, the early naturalists, and the metaphysicians have complicated the discussion of instinct by bringing in the question as to whether consciousness is present, and if so, to what extent. This additional element of consciousness in the instinctive response was supposed to differentiate instinct from reflex. However interesting a question this may be from the standpoint of general psychological theory, it seems relatively futile to attempt to introduce psychological considerations of a structural kind into any discussion of instincts in the present state of animal psychology. If instincts are defined as above, it is clear that neither the human animal nor one lower in the scale is conscious of the end to be gained by the first exercise of any instinctive group of responses. Even the human adult cannot image what has never formed a part of his perception. It is unreasonable to suppose that there can be any plan, picture, or image of a nest of any kind in the mind of the thrush which has been hatched in an incubator and reared in isolation from all other birds; nevertheless, at the proper time she will construct her nest true to the species type, and go through with the whole breeding cycle. The separate movements from a psychological standpoint are not voluntarily initiated; there are no images anticipatory of the series of acts or of their results. As James states it, the animal is so constructed that it must act in that way, in the presence of such stimuli. On the other hand, it may be argued with some justice that the process may be and probably is an intensely conscious one from the standpoint of the presence of sensations; one has good reasons for supposing that the bird is visually aware of the stick and the twine — of their form, size, and color (though even these functions are really hypothetical until decisive experiments have been made), — and that she is conscious of her movements toward them; of their weight and contact values as she picks them up; and, furthermore, that she is vividly conscious of her own emotional state. It may be likewise argued that after the bird has built her first nest, arguing by analogy from human processes, she might be able to image it when absent from it, since by building it instinctively she has laid a perceptive basis for the rise of an image. In other words, while the animal is not planning or controlling the situation voluntarily in this first exercise of the instinct, she is "feeling" vividly her emotional state and is conscious, however poorly she may analyze the experience, of the visual, auditory, tactual, and kinæsthetic stimuli which assail her from within and without as she successively goes through with the separate acts.

Method of studying Instincts. — Present-day comparative psychology, looking at instincts from the above objective standpoint, is taking up individual instincts and making a detailed experimental study of them. It is thus rapidly enlarging and making more definite our concept of what in any given case is an instinct. It is showing that what was earlier called instinct is in most cases a delicate and complex combination of instinct and habit. It is impossible except by laboratory methods to separate the congenital (phylogenetic) from the acquired or habit form of reaction (ontogenetic). Within the last few years it has been shown that the responses of practically every organism, from amœba to man, are plastic and modifiable, and that all animal forms actually do alter their original or primary congenital modes of response, where necessary, in the direction of habit. The young of any given species must be watched from the moment of birth until the last instinctive cycle (those connected with reproduction) appear. This has now been partially done, but only in a general way, for the young of several species of birds and mammals. The work of Morgan, Spalding, Porter, Watson, Craig on the birds, and of Wesley, Mills, Small, and Yerkes on young mammals, shows quite clearly that many apparently simple instincts are not completely congenital at all. Lloyd Morgan has shown that the drinking response in young chicks is very imperfect until habit factors enter in. Breed, at Harvard, has shown that the pecking response in the same animal is very imperfect at birth, and that it is only gradually learned.

Many of the instincts at birth, however, appear, though later experiments may prove the case to be otherwise, perfect without modification, such as the building of the first nest by young birds, brooding, rearing of the young, many of the responses of the insecta, etc. Unquestionably, as these activities are engaged in from season to season, habit factors may and do enter in. The scientific way, then, of approaching the problem of instinct is to isolate the young animals, and to observe what reactions will from time to time unfold themselves (congenital responses), and then to determine experimentally how these congenital responses are supplemented and changed by habit.

The explanation of why there is a congenital response taking place before experience or tuition can have played any part must be sought for on evolutionary grounds. All organisms are born into the world with certain structural modifications which force the animal to react, however imperfectly, in a certain way in the presence of certain stimuli. The origin of such structures is a mooted question to-day, and no satisfactory answer can be given. We sketch below the two most important hypotheses.

Origin of Instincts. — Darwin's theory of the origin of instincts by the process of gradually heaping up favorable fluctuating variations, the process as a whole being under the influence of natural selection, has already been discussed. (See DARWIN.) In recent years Darwin's theory has been shown to be untenable. In the first place, while it is true that all individuals of a given species do show fluctuating variations when compared with the norm or average, it has been shown by a number of investigators, including Nillson, De Vries, Jennings, Morgan, Pearl, and others that such variation cannot be heaped up along specialized lines, as Darwin supposed. Fluctuating variations are not inherited; consequently, they have no bearing on the theory of evolution.

"The use-and-disuse hypothesis" (and the theory of lapsed intelligence of Wundt, Cope, and others, based on it) of Lamarck, and espoused as a supplementary hypothesis by Darwin, has been practically abandoned by biologists for lack of experimental support. The same may be said of the third of Darwin's principles for accounting for the origin of instincts; namely, his theory of secondary sexual characters. Being forced to abandon these Darwinian hypotheses, we are forced by the experimental method to seek some other mode of accounting for structural differentiations. Fortunately, the recent work of Bateson, De Vries, Nillson, McDougall, Vail, and Shull, and of Tower and others, throws light on this question. De Vries's work on the evening primrose, *Œnethera Lamarckiana*, is probably best known. For over twenty years De Vries bred this plant under conditions of scientific accuracy. His first culture gave a wholly new mutation — *i.e.* a wide and totally unexpected and unpredictable variation, as distinct from the usual slight, fluctuating variations. In the continued cultivation of it other mutations — some of which are very striking, such as the dwarf, *O. Nanella*, and the giant, *O. Gigas*, were observed. Some twelve mutations from the original pure strain, *O. Lamarckiana*, have been described by De Vries, all of them breeding true to the type, and appearing without intermediate forms. In other words, differentiation in this plant takes place by jumps — mutations, and such mutations are hereditary. McDougall, Vail, and Shull have shown that these mutations may be experimentally produced by the injection of certain solutions directly into the plant ovaries.

By far the larger amount of this work on the production of new types and races has been done on plants. The color form and behavior changes noted by Tower in his chrysomelid beetles parallel the work of De Vries on plants. A great mass of work, similar in character to that of Tower, is accumulating. In addition to mutations which have been obtained experimentally, it is now generally recognized as being the most probable assumption that the breed of hornless cattle in Paraguay, the long-horned sheep in Brazil, the Ancon sheep in Massachusetts, to use familiar illustrations, arose suddenly and by mutation. De War and Finn in a recent book, *The Making of Species*, devote several pages to a discussion of mutation in animals.

The conception that the special structures underlying instinctive responses arise by discrete and sometimes large variations, as well as that species themselves arise in this way, is rapidly gaining ground. According to the mutation theory, congenital adaptations are not slowly produced by environment, but are the accidental correlates of the particular structures with which the mutant happens to be endowed; and it is with these adaptations that the new type must begin its struggle for a suitable environment. If the mutant springs forth at a time when the environment is such that the actions on the part of the animal necessary for obtaining food, shelter, and the reproduction of its kind can be called forth, — or, put the other way around, if the mutant is fortunate enough to begin life with a series of responses adequate to meet environmental demands, that type of mutant can exist and procreate its kind, leaving adequate paleontological record behind it; if not, the variant is annihilated, without leaving marks of its temporary existence. Natural selection, while not being responsible for the formation of new structures, and hence of new responses, is still operative in eliminating the unfit variants. What boots it whether the snail is coiled to the right or to the left; or that certain crustacea have one claw so much overdeveloped that its possession must be a disadvantage, so long as these animals possess enough favoring adaptations to make the necessities of life obtainable? Selection will allow the mutant many peculiar and non-advantageous structures; it steps in only when there is an actual deficiency in the number and complexity of functions necessary for life and reproduction.

Human psychology is especially interested in this theory of mutations by reason of the fact that it does away with the necessity of looking for adaptive value in certain emotional and instinctive attitudes, as in dizziness, trembling, nausea, and many other such reactions which put the human subject at a disadvantage in critical situations.

Important Human and Animal Instincts. — Any complete or general inventory of animal instincts is impossible at the present time, because (1) animals possess so many instincts that students of behavior have not had time to study them exhaustively in any one species; and (2) instincts differ too widely in the different species. All animals may be said roughly to possess many adaptive specialized congenital modes of reacting to food, enemies, shelter, and sex, and to possess, in addition, many other congenital modes of response which are accidental and non-adaptive. Special studies in animal psychology will give soon, it is hoped, a clear and concise knowledge of the order of appearance and the number of instincts in any given form; their fixity, variability, and modifiability; their constant, cyclic or deferred character, etc.

The important human instincts appearing later than the group immediately connected with the preservation of life (such as sucking, crying, sneezing, etc.) are in just as much need of careful study as are the instincts of animals. Angell in his *Psychology* gives the following as the probable list: Fear, anger, shyness, curiosity, affection, sexual love, jealousy, envy, rivalry, sociability, sympathy, modesty (?), play, imitation, constructiveness, secretiveness, and acquisitiveness. It is easy to see first that many of these are questionable instincts, as for example, modesty, imitation, affection; secondly, that many of these are general terms which cover groups of instincts. Play, for example, consists in the releasing of many congenital responses, and the number and character of these responses differ widely with respect to the objects calling them forth. A kitten will play with its tail or a ball of twine, or it will engage in a mock combat with its fellow, or tease a helpless mouse. The responses differ greatly in the several cases. A similar condition obtains in the child. Thirdly, many of them are so masked by the network of habits which the child has formed before the responses appear that the pure and characteristic instinctive group cannot be isolated. Jealousy, envy, rivalry, sociability, and sympathy are of this type. In the child they show really the beginnings of conscious attitudes. There is an instinctive *Anlage*, but little more. The works of Preyer, Perez, Shinn, Major, Baldwin, and Stern deal largely with instincts in the child, but mainly from an observational standpoint.

Psychological Bearing of Instinct. — While the mechanics of instinct *per se* interests the student of behavior mainly, the human psychologist is concerned with them first because of the light they throw on the origin of emotion; emotion always appears in the human being in conjunction with instinctive expression. Secondly, by reason of the fact that all volitional control has its origin in instinctive movement. Thirdly, by reason of their intimate bearing on adult impulses, motives, and attitudes.

Pedagogical Bearing of Instincts. — A study of instincts is of the highest importance pedagogically because the changes in the interests of the child are somewhat determined by changes in the instinctive and emotional complexes. Instincts ripen serially and decline serially — each one as it comes brings about an interest in a different set of objects and a different focus of attention, as shown very clearly at the onset of puberty. James, in his *Principles of Psychology*, speaks very vividly of "striking while the iron is hot," *i.e.* of choosing the favorable moment when the child is instinctively interested in a group of objects, to instill proper modes of reacting to these objects and to store up knowledge about them. While he largely overestimates the number, independence, and permanence of instincts of this class in man and of their adaptability for such a stamping-in process, there is such an element of truth in what he says that no teacher can neglect the study of human instincts.

A large group of educational psychologists, in their adherence to the reduplication theory of Cope, have carried the process just described to an unwarranted extreme. The child is supposed to duplicate in ontogeny the whole phylogenetic process. We are taught by them to find in the growing child a series of culture epochs, similar to the rough-stone age, the hunting stage, and the agricultural stage in primitive man. The above school has based educational theory and practice on this hypothesis. It remains to be said that this aspect of the reduplication theory is based on the most flimsy biological speculation, and that modern experimental biology finds few data supporting it. In exceptional and isolated cases there appear to be certain growth processes which are apparently reduplicative in character. But nearly all such changes take place in the embryonic stages or during the early period of infancy. To carry this process over to the child of eight, ten, and twelve years of age, and to base an educational system upon it, is building upon a foundation of sand.

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INSTITUTE, FRENCH (INSTITUT DE FRANCE). — A French association comprising a group of societies for the advancement of literature and science in all their branches. An association of this type had been planned by Richelieu when the French Academy was established in 1635. In the same century, under the influence of Louis XIV and some of his ministers, there sprang up the Academy of Fine Arts (1648), the Academy of Inscriptions (1663), and the Academy of Sciences (1666). These were all abolished by the Convention in 1793, and in their place the *Institut National des Sciences et des Arts* was established in 1795, "charged with collecting discoveries and with perfecting the arts and sciences." Its members were now drawn not from Paris alone, but from all parts of France, and foreign associates were also elected. The plan appears to have been suggested by Talleyrand and Condorcet. There were three classes devoted to (1) physical sciences and mathematics, (2) moral and political sciences, and (3) literature and fine arts. In 1803 the Institute was reorganized with four classes with a new distribution, excluding moral and political sciences at the order of Napoleon. In 1816 the old names of the academies were restored, and in 1832 the Academy of Moral and Political Sciences was revived and the name was changed to *Institut de France.* The membership consists of regular and honorary members, foreign associates, and corresponding members. Election is by ballot, confirmed by the government. The members receive 1500 francs a year each. The Institute is located in the old Mazarin Palace. The library, which includes the old town library of Paris allotted to it in 1797, contains a valuable collection of books. The Institute has the right to nominate professors to the College of France, the Museum, Schools of Rome and Athens, School of Maps, School of Oriental Languages, Conservatory of Arts and Handicrafts, the Observatory and the *École Polytechnique.* One of the important functions exercised by the Institute is the award of prizes for distinguished services to literature, science, and arts. Funds are provided by the state and private benefactions, the general funds being administered under the supervision of the Minister of Public Instruction, and departmental funds by each academy.

See Academy.

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INSTITUTES. — The teachers' institute is a distinctly American institution. As originally organized, the purpose of the institute was to provide opportunities for the review of the subjects taught in the common schools, to give suggestions on methods of teaching and school management, and to stimulate teachers to self-improvement. For a time the institute did the work of the normal school in the professional training of teachers, and in parts of the country, where normal schools do not meet the needs of rural communities, the institute continues to provide abbreviated courses of professional training. Where, however, normal schools are reasonably well organized, the institute serves the purpose of an education gathering for the discussion of broader professional subjects. The summer school, in many parts of the United States, is taking over the function of the teachers' institute.

In some parts of the country the institutes are under state auspices and are generally organized by the state superintendent of public instruction. In most states the county is the unit, and the county superintendent is the responsible director. In cities of 20,000 and more inhabitants, separate institutes are generally held under the direction of the city superintendent of public schools. In most of the states there are special appropriations from the school funds that meet part of the cost of the institutes. Such funds are generally supplemented by membership fees on the part of the teachers or by fees that accrue from the licensing of teachers. The duration of the institute varies from one day to six weeks. Some states have paid corps of institute instructors, but most states secure the services of members of the faculties of the state normal schools and colleges and other educational workers to give the instruction. In institutes that are in session a week or less, the instruction is generally of a purely professional character and is given in the form of lectures. Where the sessions are of longer duration, the teachers are organized into classes for more definite academic instruction in the elementary school studies.

Historical Development. — The first teachers' institute was held at Hartford in the autumn of 1839 by Henry Barnard (*q.v.*). Twenty-six young men, some of whom had already taught in the common schools, were organized into a class and given instruction for six weeks. In the previous winter Barnard had asked the state legislature to make an appropriation to enable him to organize two such institutes, one for male and one for women teachers. As the measure failed in the senate, he organized a class of men at his own expense, with slight aid from some friends of education in Hartford. He wished to show the people of Connecticut, he said, " the practicability of making some provision for the better qualification of common school teachers, by giving them the opportunity to review and extend their knowledge of the studies usually pursued in the district schools and the best methods of school management, instruction, and government, by means of recitations and lectures conducted by experienced and well-known teachers and educators."

At this first institute held at Hartford, Charles Davies, (*q.v.*), the well-known author of mathematical textbooks, gave instruction in arithmetic; Thomas H. Gallaudet (*q.v.*), had the classes in composition and school government; Mr. Barton, of the teachers' seminary at Andover, gave lessons in reading; Mr. Brace and Mr. Wright, of the Hartford schools, had charge of the subjects of geography, spelling, and writing, and Mr. Barnard himself gave lessons in principles of teaching and school hygiene. " A portion of each day," writes Mr. Barnard, " was devoted to oral discussions and written essays on subjects connected with teaching. The students also spent some time in visiting the best schools in Hartford."

The experiment was repeated the next year (1840), with the addition of a class for women teachers. It was not until 1847 that the legislature of Connecticut provided the funds for the organization of institutes (two in each county) at state expense. Private initiative, however, had made possible many such institutes in different parts of the state, at which such well-known educators as Henry Barnard, Thomas H. Gallaudet, William A. Alcott, Jesse Olney, Charles Davies, and J. E. Lovell gave instruction. These early gatherings in Connecticut were not called institutes, but teachers' classes.

In 1842 J. S. Denman, the superintendent of schools in Thompkins County, New York, conducted for two weeks a class of teachers for the purpose of " reviewing and extending the topics taught in the common schools." He called his class a teachers' institute. This was probably the first use of the term. In the following year Mr. Denman held an institute for six weeks. He was assisted in the instruction in his institutes by James B. Thomson, David Powell, Salem Town, and David P. Page (*qq.v.*). By 1844, remarks Mr. Fowle in an article published at that time, institutes were held in most parts of the state. In 1847 the legislature of New York appropriated $60 toward defraying the expenses of teachers' institutes in each county in the state.

Rhode Island was probably the first state to organize institutes under state auspices. Henry Barnard, then at the head of the school system, held institutes at Westerly and Providence in 1844. During the next few years institutes were held in all parts of the state, and such well-known educators as William H. Wells, John Kingsbury, Charles Davies, Josiah Holbrook, Samuel S. Greene, Francis Wayland, and William B. Fowle (*qq.v.*), were secured as instructors. The institutes of Rhode Island had several unique features. One of these was the teaching of " model lessons " by William G. Baker. A covered wagon was fitted up, and this conveyed Mr. Baker and a dozen children about the state. At each institute Mr. Baker gave lessons in the different elementary school subjects, to show the members of the institute " how to teach." Another feature was the distribution of educational tracts and almanacs at the evening sessions, which were of a general nature and attended by the people of the community.

An institute was held at Sandusky, Ohio, in 1844, under the guidance of Judge Ebenezer Lane. He was assisted by Henry Barnard, Salem Town, and A. D. Lord. Many similar meetings were held during 1845 and 1846, that were supported by private contributions; but in 1847 the state legislature authorized the county commissioners to appropriate certain funds for the payment of instructors and lecturers at teachers' institutes.

As Massachusetts had organized two state normal schools in 1839 (Framingham and Westfield) and a third in 1840 (Bridgewater), institutes were not held in that commonwealth until 1845. In October of that year, Horace Mann (*q.v.*) organized a ten-day institute at Pittsfield, and before the end of the year institutes were held at Fitchburg and Plymouth. Massachusetts secured from the first a corps of strong men to give the instruction at the teachers' institutes, including such distinguished educators as William Russell, John Pierpont, Sanborn Tenney, Samuel S. Greene, Lowell Mason, C. D. Colburn, Josiah Holbrook, William H. Wells, and at a later date the three Swiss-Americans, Louis Agassiz, Arnold Guyot, and Hermann Krüsi, Jr. (*qq.v.*). As the instructors were employed by the state board of education, they were also assigned to the different normal schools to give courses of lectures and lessons. It may also be mentioned that in Massachusetts such new subjects as singing, physiology, and mental arithmetic were popularized at the institutes before being introduced into the schools.

The first teachers' institute was held in Pennsylvania at Columbus, Warren County, in 1848. It was conducted by Fordyce A. Allen (*q.v.*) and J. C. Moses. Institutes were held in Lawrence County in 1851, Indiana County in 1852, and Lancaster County in 1853. In 1854 the legislature granted aid to teachers' institutes, and in 1867 they were made an integral part of the Pennsylvania school system. Among those who took active part in the early institutes held in the Quaker State were Thomas H. Burrowes, James P. Wickersham, Fordyce A. Allen, John F. Stoddard, and S. S. Haldeman (*qq.v.*).

With the organization of the state school systems, teachers' institutes in one form or another became a part of the educational machinery; and although they have changed greatly in character in the more thickly populated states, they are still a part of the school systems of practically all the American states. Originally peripatetic normal schools, often extending their sessions into weeks, to-day in such populous states as Massachusetts, Rhode Island, Connecticut, and New Jersey, they are rarely in session more than one day. At an earlier period the institutes were of special value in arousing and solidifying public sentiment in favor of state-supported schools, in disseminating useful knowledge concerning methods and principles of teaching, and in enriching the common school course by popularizing new subjects. As the number of trained teachers has increased, the institutes have tended more and more to become general education conventions for the discussion of current educational problems. W. S. M.

Present Status. — As at present conducted, the teachers' institutes aim to provide general academic instruction, professional training, discussion of immediate problems, and professional inspiration. They thus attempt to take the place of training schools, teachers' associations, and social organizations. As a rule institutes are held once a year and last five days; though they vary from one day, in New England, to five or six weeks in some of the Southern states. The most common unit is the county, except in Colorado and Nevada (institute districts), and New York (school commissioner districts). In Rhode Island a state institute is held. Counties may join to hold institutes. In three states (Michigan, Nevada, and Nebraska), state institutes are held. Attendance is compulsory in twenty-eight states, and, although optional elsewhere, various inducements (*e.g.* continued salary, per diem expenses, mileage allowances, and a percentage toward grading) are offered. The institutes are maintained by the state or by fees from teachers for examinations, licenses, and registration. Instructors may be appointed by the state or by the local authority from a list prepared by the State; in some states the instructors must be licensed. Commonly the normal school faculties supply instructors, although the range and scope is, of course, much wider. The institutes are in the main attended by rural school teachers, occasionally by city school teachers, hardly ever by high school teachers. The system of institutes has been severely criticized within recent years. The chief ground of objection is that it is an anachronism. It had a place when there were no facilities for the training of teachers. But since the establishment of normal and summer schools it merely connives at inadequately trained teachers in attempting to do training work for about five days in a year. Further, the programs are as a rule haphazard, unconnected, and require no preparation, and are followed by no discussion. Frequently the lectures have become inspirational and entertaining in the worst sense. The tendency at present is to permit teachers to attend summer schools in place of institutes, to lengthen the period of the institute, making it almost a summer school; to require definite preparation of some connected educational topics; and to conduct the meetings as classes in a school or college. Ultimately the institute will disappear, but before that time professional standards must be raised, universal training and higher qualifications must be insisted upon, and teachers' associations must play a more significant part in the teacher's life than at present.

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INSTITUTES OF INSTRUCTION. — See American Institute of Instruction.

INSTRUCTION. — See EDUCATION AND INSTRUCTION.

INSTRUCTION, COST OF, IN COLLEGE AND UNIVERSITY. — See UNIVERSITY AND COLLEGE, COST OF INSTRUCTION IN.

INSTRUCTION, HYGIENE OF. — See HYGIENE, SCHOOL.

INSTRUCTION PERIOD. — The weekly program of the school is made up of periods which are assigned in varying quantity to the several school subjects, hence we speak of the arithmetic period or the grammar period. These class periods are further classified according to the function, use, or value of the activity employed. Thus, if the period is assigned for the purpose of instruction by the teacher, it is called an instruction or recitation period; if for preparation by the pupil, a study period. All periods cannot be thus classified, as several purposes may be present in one exercise. H. S.

See LESSONS, TYPES OF; MANAGEMENT, SCHOOL; TEACHING, TYPES OF.

INSUBORDINATION. — See SCHOOL MANAGEMENT; REWARDS AND PUNISHMENTS.

INSURANCE COMPANIES, EDUCATIONAL WORK OF. — Quite recently insurance companies have realized that in addition to guarding the interests of policyholders by thorough medical inquiry, it may be possible to lower the death rates generally by a system of education along the lines of sanitation and hygiene. It is recognized to-day that many diseases are preventable, and that, if the population generally could be educated regarding the possibilities of prevention, the population mortality might be effectively reduced. It is for this reason that certain life insurance companies are working hand in hand with public officials in the direction of spreading the gospel of education in sanitary and hygienic matters. The general subject of prevention of disease and conservation of human life has been fully dwelt upon in the report of the National Conservation Commission by Professor Irving Fisher, entitled, *National Vitality, its Waste and Conservation.*

The large majority of life insurance companies conduct so-called " ordinary " business. The risks on which they write policies belong to a better financial stratum of society, and are able to take insurance in amounts of $1000 and upwards. The mortality in this group, for obvious reasons, is lower than in the general population, and at some ages is only one half of the mortality in what may be termed " industrial " population. A number of the companies not only write so-called ordinary insurance, but industrial insurance as well. This form of insurance has been arranged for the working classes, and permits them, through the payment of small weekly premiums, to insure themselves against death. For this group, however, it has been necessary to devise a special mortality table based on the experience gained from a study of the mortality in this particular group. The individuals comprising the industrial masses are less in a position to avail themselves of the opportunities to guard themselves against disease, and for this reason a campaign of education directed specifically to them may have a tendency to bring about better results than a campaign among the better circumstanced.

Of the companies which have attempted a campaign to improve the physical conditions and the health of their policyholders, probably the most noteworthy are the Provident Savings Life Assurance Society, recently merged with the Postal Life Insurance Company, the Metropolitan Life Insurance Company, and the Equitable Life Assurance Society. The first named company, in August, 1909, organized a so-called " Policyholders' Health Bureau," through which the company has issued health bulletins to policyholders, keeping them informed of the most recent advances of science in the promotion of health and the prevention of disease, and answering inquiries on matters of health. The various bulletins which have been issued by the company treat of the evil results due to intemperance, and overeating, and the contingencies from various poisons. In one number, the bureau discussed certain of the so-called preventive diseases, such as pneumonia and typhoid fever. Another number was given over to the use of narcotics and the dangers attending their use.

Outside of the field of the life insurance companies several of the accident companies have published bulletins in reference to the prevention of accidents. Here in particular may be mentioned the bulletin published by the Fidelity and Casualty Company of New York on *The Prevention of Industrial Accidents.*

The campaign of education which was begun in 1909 by the Metropolitan Life Insurance Company of New York has been directed primarily to its so-called industrial policyholders, representing all nationalities, and in many instances individuals who have but little education and no opportunity of coming in contact with modern current thought on the subjects of health and hygiene. To meet the needs of this large group, the company through its agents who visit the policyholders weekly has distributed pamphlets of various kinds on the movements which have sprung up to improve living conditions and to prevent disease. For years the company has published a periodical. Incidentally, it has attempted to place in the hands of its policyholders articles written in a popular fashion on subjects dealing with the health of the family, and in particular with the health of the children in the family. The magazine in a sense is a children's magazine.

The illustrations which it contains, and many of the articles especially prepared for it, have been published with the children in mind. Some of the articles which have appeared in the last year are the following: *Just Flies*, calling attention to the danger of the fly as a transmitter of disease; *If you have a Baby, Place this where you will See it Every Day; Chinese Doctors; Daily Health Hints; Summer Clothing for the Children; Our Glorious Fourth; Seven Laws of Infant Health; Physical Defects which may be Overcome*, etc.

The company, as would be expected, suffers a heavy loss from deaths due to tuberculosis. In the year 1908 there was a total of 92,411 deaths, of which 16,585 were caused by tuberculosis. Of these the number of deaths of children over one and under fourteen years of age was 1330, or 8.01 per cent, and it is clear that the reduction of mortality from this dread disease is of vital importance to the company. An effort has been made to educate policyholders regarding the causes of the disease, its cure, and its prevention. Over four and a half million copies of a pamphlet, *A War upon Consumption*, printed in ten languages, have been distributed to policyholders. This pamphlet, as well as others which are issued by the company, was put in an attractive form so that it would be read. Copies have been distributed to school children in certain cities at the request of the authorities, and in one instance the pamphlet has been used as the text for compositions and essays written by the children. Supplementing the above pamphlet, the company prepared a list of the tuberculosis sanatoria, hospitals, dispensaries, classes, and associations in the United States and Canada, which it has distributed among its policyholders suffering from the white plague, and one which is entitled, *Directions for Living and Sleeping in the Open Air*. It is hoped through this pamphlet many policyholders who are unable to obtain sanatorium treatment may attempt to obtain treatment in their own homes. The company has at present in preparation a booklet on domestic hygiene and the care of children.

The company has also been experimenting for the last two years in the direction of sending visiting nurses to its industrial policyholders suffering, not only from tuberculosis, but from any disease which may require nursing. But the actual treatment and care given by the nurse is probably the least of her activities. From the standpoint of prevention, the value of the nurse consists in the education along sanitary and hygienic lines which she is spreading broadcast in every home which she visits. There can be little doubt that in time, while it may not be possible to prove the matter by actual statistics, there should be an improvement to a greater or lesser extent in the mortality of policyholders, and in particular their general welfare will be materially enhanced. It is hoped that the nurse will be of particular value in preaching the doctrine of the prevention and cure of tuberculosis in connection with the pamphlet, *Directions for Living and Sleeping in the Open Air*, to policyholders unable to obtain sanatorium treatment. A nurse, plus the pamphlet, should in time produce tangible and visible results. Maternity cases have been given particular consideration in this nursing experiment both before and after the birth of the child.

As a matter of interest, it may be mentioned that at present the experiment is being conducted in approximately 775 cities and towns, in the greater number of which the service has been installed but a very short time. The statistics for the year 1911 show a total of over 675,000 visits. Visits are requested in the main for acute diseases, that is, where there is a stronger possibility of recovery. Under these may be included pneumonia, grippe, bronchitis, and various children's ailments such as convulsions, paralysis, etc.

It may be said that an insurance company that protects the lives of the working classes has assumed very definite responsibilities. To what extent such a company may further enlarge or increase its activities is problematic. The activities mentioned above indicate the possibilities, at any rate. Much will depend on the extent to which it may go under the provisions of its charter and the laws of the several states. That the extension of such work by an insurance company, that the endeavor on its part to better the circumstances of its policyholders and in particular to increase the length of their lives, are subjects worthy of the deepest consideration, is beyond doubt.

L. K. F.

INTEGRAL CALCULUS. — See CALCULUS.

INTEGRATION OF STUDIES. — See CORRELATION.

INTELLECT. — Intellect is a term which has been employed in a broad and in a narrow sense. In its broadest sense it includes all of the processes of knowledge as distinguished from the emotions and will. Thus we speak of the exercise of the intellect on the part of any "one who is of higher grade than the imbecile." In the narrow sense, the term intellect has been employed to designate the higher forms of mental activity as distinguished from certain of the lower forms of knowledge. Thus the mere processes of sensory experience are not to be regarded as belonging under this term when used in its narrower sense. This distinction is clearly marked in the title employed by one of the great English psychologists, Bain, in his volume *Senses and Intellect*. Here the intellectual processes are those of discrimination, comparison, memory, judgment, reasoning, etc. The processes of sense recognition, on the other hand, are treated as forms of knowing which are carried on at a lower level. This distinction is very often employed in defining the relation between human and animal consciousness. Man is said to be distinguished from the animals by his possession of intellect. This, of course, does not signify that man is superior to the animals in sensory processes. It indicates rather that the material which is supplied by the senses is employed in human life in higher forms of comparison and discrimination.

C. H. J.

See MIND; PSYCHOLOGY; and for educational bearings, EDUCATION; IDEAS; KNOWLEDGE.

INTELLECTUAL EDUCATION. — See EDUCATION.

INTELLIGENCE TESTS, BINET. — See TESTS, INTELLIGENCE.

INTEMPERANCE. — See TEMPERANCE, INSTRUCTION IN; ALCOHOL, THE USE AND PSYCHOLOGICAL EFFECT OF.

INTENSITY. — One of the attributes of sensation. The intensity of the sensation is related to the amount of energy that affects the sense organ. The difficulty in dealing with the intensity of mental states is that it is impossible to compare two intensities unless they are in consciousness in close succession, and then it is not possible to do more than say that one intensity is greater or less than another. Measurement in the sense that it is used in the physical sciences is impossible. The only measurements that have been made are of the amount of physical stimulus that will just give rise to a sensation in any department and the difference in two physical intensities that may just be appreciated. The discussion of the first problem is given under the different senses, of the second under Weber's Law. W. B. P.

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INTERACTION. — See BODY AND MIND; NERVOUS SYSTEM.

INTEREST. — The "doctrine of interest" in education is a sort of shorthand expression for a number of different motives, which focus in the recognition of the necessity of discovering points of genuine and intimate contact between the subject matter of instruction and the vital experience of pupils, an experience that exists and operates independently of attempts to master the subject matter. The etymology of the word "interest," namely, *inter* and *esse,* to *be between,* suggests, if it does not adequately convey, the idea. Interest indicates that no gulf exists between material to be learned, lesson material, and the concrete mind of the pupil — that the mental powers and tendencies find themselves at home in the material of study, that the material awakens congenial responses in the self. So regarded, an interest in a problem, a topic, a subject, is evidence that there is a vital union between the student and his study. Its opposite is the feeling of alienation and repulsion that accompanies the presentation of matter that is foreign to the experience of the student.

Psychologically, interest and attention are closely allied events. They are frequently regarded as the subjective and objective aspects of the same activity. That is to say, the effective assimilation of new material into the course of experience is interest when viewed from the standpoint of the mental affection, the emotion and personal attitude, that accompany it. It is attention when viewed as the active outgoing of mental habits in grasping and mastering the subject matter. Other views regard interest as prior and as the source of attention; or, *vice versa,* conceive interest as the emotional result of a prior act of attention. All views, however, acknowledge the intimate connection of the two; and it is this close connection which is the significant matter for education. Like attention (*q.v.*), interest as a state of mind depends upon the proper balance of the old and the new in experience. Where the material is almost wholly new, there is excess of stimulation; the responsive powers of mind are overwhelmed and confused. Discouragement and aversion result. As the term "aversion" implies, there is a strong tendency for the mind to turn away and devote itself to some more congenial and rewarding topic. Even if this tendency is partly overcome, it means divided, and consequently wasted, energy as compared with the unified, whole-hearted activity where interest is naturally and directly sustained. On the other hand, the thoroughly familiar denotes the mastered, the habitual. It sets off tendencies that work automatically and mechanically. If there is also a new factor about which habits may play, these habitual tendencies will furnish the background for intense and concentrated interest. But if there is no stimulation beyond that evoking the established habits, the result will be ennui, monotony, routine. The effect is that of walking in a treadmill where nothing new is achieved. Put in other words, a certain degree of difficulty, a certain amount of obstacle to be overcome, enough to set the problem of a readjustment of habit, is necessary for sustained interest. If the self is to put itself wholeheartedly into what it is doing, its powers must be thoroughly awakened, and this is impossible without a challenging difficulty.

The fact just stated throws light upon the relation between desire (as standing for interest) and effort, and helps place the relation of the doctrine of interest to that of discipline. As long as children "live in the present," they are absorbed in their immediate concerns. All their powers are directed at and, so to speak, discharged upon, the immediately present stimulus. There are no *ends*, that is to say, no conceived results to be reached, after an intervening time, through the controlled adaptation of conditions as means — or the end lies in such a near future that but little thought has to be given to the management of intermediate conditions.

This state of *immediate* interest characterizes the "play activities." When more remote ends are entertained as objects to be reached by the consistent and sustained maintenance of a series of acts that, of themselves, lack immediate interest, (but that are of interest because of their importance for the remoter end in view), we have *mediate* interest. Being dependent on an idea, mediate interest involves an intellectual interest in a way, in which the emotional heightening accompanying direct absorption does not. The interest in a more or less prolonged series of acts is dependent upon the persistence of an *idea* — the thought of an end and the thought of the bearing of the immediately present upon the attainment of this end. The control of the activity, and the source of interest, reside in what is *conceived*, what is physically absent, not in perception or what is physically present.

The remoteness of the end in time means of course increase in the number of difficulties to be dealt with; there is a series of difficulties to be dealt with one after another. Consequently the seriousness, the depth of the interest of the self in its objective — its aim — is continually being tested and retested. If the interest is slight and passing, the emergence of a difficulty in an unexpected form or in an unusually strenuous way will distract the mind from its pursuit, and lead to taking up something which has an immediate, non-intellectual value. On the other hand, if the self is deeply concerned with, thoroughly committed to, its object, each successive obstacle will deepen the sense of the importance of the object and increase the *effort* expended in behalf of its realization. In many cases, perhaps the majority of cases, there will be an oscillation: a tendency to surrender the end in behalf of some more immediately interesting object, and a tendency to cling to the end, to emphasize its importance, in order to enlist further effort in its behalf. Under these conditions, while physical effort will go to the means for reaching the end, moral and intellectual effort will be directed to sustaining the idea of the end in such force as to give it motive power.

We have here all the elements of a seeming conflict of interest and effort, with immediate attractiveness, immediate agreeableness on the side of interest, while serious and important values are all on the side of effort. Hence the situation has been frequently completely misinterpreted in theories of education, with respect to both its intellectual and its moral implications. That is, interest has been regarded as an inherently unworthy and objectionable factor, operating only as a temptation away from the objectively important; it has been identified with the attractive and swerving power of the immediately pleasurable over against what thought — or reason — shows to be *really* worth while. This implies that the objectively valuable end is totally lacking in inherent interest, so that sheer effort of the will has to be relied upon as the sole motive for keeping the self in its right course — for keeping it struggling against the seductions of "interest."

The previous analysis should reveal what is at fault in this interpretation. What sustains effort is not sheer appeal to will power, but interest in the end — the interest that is indirect and intelligent, as distinguished from that which is immediate, purely personal, emotional, and sensuous. The genuine educational need is, therefore, not to eliminate interest, but to foster the *indirect* interest, the interest attaching to the end in view, to make it more powerful than the immediate interests which would, if they became motive forces, take the self away from its end, and reduce action from the plane of thought to that of sense. The import of immediate interest is quite different before and after reflection and the conceiving of remote ends have entered in. When thought is not playing an important part, or when the situation is such that there is no need that it should play a considerable rôle, immediate interest is simply an indication of hearty, wholesome outgoing activity of the self, a sign of its ability to identify itself with its surroundings, to express itself therein and to find itself reflected by the environment. It remains a fundamental trait of all æsthetic and artistic manifestations. Moreover, in the degree in which the interest in the end is seriously sustained and worked out, it tends to transfer itself to interest in the means of reaching the end. A new type of immediate interest is thus developed, one which is as direct, as hearty and spontaneous, as the earlier personal and sensuous interest, but one which depends upon the intervention of thought. When an individual becomes intensely and sincerely interested in an end which reflection holds up, the sense of separation between means and end tends to disappear. The means become saturated with a sense of the value of the end; and the end is so identified with the means of achieving it that it ceases to seem remote and far away; every one of the present means represents, embodies it. This mutual interpenetration of means and end is constantly exhibited in scientific pursuits as well as in endeavors to achieve wealth and political distinction. But there is often a period between the original absence of the end dependent upon reason and the final unification of interest in intellectual end and existent means, when the thought of an end pulls one way while the immediately present conditions pull in another. In this intervening state, there is temporarily a real conflict between thought, standing for continuity of purpose, and reason, immediate interest, standing for the agreeable, the pleasurable, the direct urgency of desire. But, as already indicated, the effective way of dealing with this critical juncture is not to attempt the hopeless task of crushing out all interest by sheer effort in behalf of something totally lacking in interest; it is to reënforce by all possible means the interest in the end, so that its interest may fuse with that of means for its attainment.

We are now in a position to perceive the true and false signification of discipline in connection with interest. A disciplined mind is one that can hold to a train of thought in spite of the attractions and distractions of irrelevant considerations; it means power to attend to the conceived, and to relate the perceived (and what the imagination incidentally presents) to the conceived. A disciplinary process in education is one which tends to bring about the state of mental control. True discipline, in short, is distinctly a matter of intellectual attitude and method: the power to keep thinking in dominant control of the situation when the situation needs reflective survey and estimation. Since this clearly involves the overcoming of obstacles and the holding of mind to what is directly more or less disagreeable, the false notion of discipline arises by ignoring the function of intelligence as the source of concentration, order, and regular sequence, thereby identifying discipline with sheer effort directed to the disagreeable. Hence disciplining methods are supposed to be effective whenever a person is forced to occupy himself with whatever is uninteresting and naturally repellent. Difficulties are multiplied for the mere sake of having difficulties; tasks are assigned as tasks to discipline *will*, the power of attention to the repellent. The error is in isolating will or the power of attentive application from thought as the function of sustaining remote ends and of bringing them into close connection with means, or existent conditions.

This fallacious conception of discipline which relates it to effort to the exclusion of habits of thought is strengthened by an opposite error. One school of educators, noting the waste that comes from trying to work against interest, substitutes appeal to momentary emotional agreeableness, for both appeal to will and to the interest of the remoter end. Like the so-called disciplinary school, it fails to denote that thought, that ideas of ends or purposes, holds the key to the situation. By interest it means various devices that tend to conceal the real end from view, that lessen the need of serious thinking, and that place the control of action in the direct stimulation of present conditions. Interest thus comes to mean a sort of sugar-coating over of difficulties. Since this method inevitably relaxes discipline in its proper sense — that is, the power to utilize thinking as an effective method of guidance of action — its failure to develop continuity of application and serious industry evokes a reactionary appeal to the method of securing "discipline" by the assignment of obnoxious tasks. Then as this method fails to secure motivation and genuine regard for the materials of instruction, it in turn calls out recourse to the method of emotional stimulation. The only way out of this vicious circle is the recognition of the importance of the intellectual factor, the idea of a more or less distant end, and the necessity of reënforcing interest in it as the controlling factor.

We have noticed above that indirect interest involves an intellectual interest. At the outset, this intellectual interest, while genuine and indispensable, is secondary to the interest in achieving an end or purpose — to a practical interest in the broad sense of "practical." The transfer of interest from ends to means is, however, one of the commonest phenomena of experience, having its traditional illustration, on its undesirable side, in the miser's transfer of interest in what money will do to the money itself. But the principle has also its positively valuable side. It shows itself whenever there is developed an interest in thinking for its own sake, an interest in conducting reflection, pursuing inquiries, with no ulterior aim. Different minds differ immensely in their susceptibility to this transferability; but whenever it occurs we have strictly intellectual interests. A certain amount of intellectual interest for its own sake is necessary to a proper degree of detachment, of generosity and impartiality, of comprehensive survey of the field, even in practical matters. Hence it is an end to be cultivated in educational procedure. Some minds are as likely to fall into excess upon this side, however, as others are in the narrowly practical, unintellectual direction. Such minds become academic and scholastic, "abstract" in the bad sense of that term; their knowledge is divorced from influence upon action, theory is separated from practice. Hence ideas remain untested and unfertilized by application, while practice remains hard and narrow because not enlightened and inspired by breadth of intelligence. Owing to various historic circumstances, most schooling has come to favor unduly the fostering of the pale academic type, at the expense of those individuals whose natural and persistent interests are more active and objectively constructive. (See ACTIVITY and CULTURE.)

We have approached the subject of interest from the psychological side. This implies, however, its objective side. The term "interest," or an interest, is constantly used to denote that in which interest is taken. It is used as synonymous with a concern, a value, a dominant direction of thought and action, an occupation that is persistently important. Thus we speak of business, of science, of art, of religion, of politics as interests. This objective use of the term "interest" bears out what was originally said of interest as the point of identification of mind with its object, or subject matter. This identity may be approached and discussed — as above — from the side of the mind; but it may be equally well approached from the side of the subject matter in which the self finds its powers sustained and fulfilled. The fundamental thing, educationally, is that interest has both of these aspects. As a guiding principle or norm in education its influence should be to protect educators from two harmful abstractions: ① On the one hand, from viewing mind as something which can operate and manifest its nature all by itself in a mental, subjective region. As against this notion (and the many educational practices connected with it) ② the doctrine of interest holds up to view the need of subject matter of content in art, in science, in literature and history, in technical constructive activities, etc., in order that mind may be active and be fulfilled. On the other hand, there is the fallacy which makes the mind equally indifferent to subject matter, which supposes that if it only *will* (if it but will choose to do so), it may apply itself to any subject matter, and that any regard for the inherent choice and spontaneous direction of mind is a concession to a weak and enervating principle. As against this notion, the doctrine of interest is important in maintaining the fact that subject matter is assimilable and capable of having educative influence only so far as it is caught up into and held by certain inherent active tendencies of the self, thereby becoming an interest, a vital concern, a significant occupation of the self.

J. D.

See Effort; Formal Discipline; Herbart.

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See also the references under Herbart.

INTEREST. — In medieval Europe the objection to paying for the use of money was so great that the borrower was supposed to return only the amount of his debt. If, however, he delayed, he was held to pay as compensation a sum representing that which was between ("id quod *interest*") the creditor's position because of the delay and that which he would have occupied if the debt had been promptly paid. Hence our word "interest."

The taking of interest is very ancient. From the old records on the clay cylinders, it appears that the usual rate in Babylon was a shekel on a maneh, or about 16 per cent, although it ran even higher than this. Tablets as early as the seventh century B.C. relate that interest was computed either by the month or by the year In ancient India it appears that 15 per cent a year was not uncommon, and six different forms of interest appear, including compound interest. In the writings of Bhaskara (*q.v.*) problems appear like the following: "If the interest of a hundred for a month and one third be five and one fifth, say what is the interest of sixty-two and a half for three months and one fifth?" In Greece the interest (τόκος) was apparently not restricted by laws but the rate varied from 12 per cent to 18 per cent. In Rome, interest was called *fenus*, or, later, *usura* (generally in the plural, *usuræ*). The rate was at first unrestricted, but the *Duodecim Tabulae* (450 B.C.) limited it as between Romans to 8⅓ per cent. The *Lex Genucia* (342 B.C.) prohibited the taking of interest, but, like the medieval law, it was probably laxly enforced. In later Roman times the Eastern custom of monthly interest came into use, the ordinary rate being 1 per cent, or 12 per cent per annum. In Cicero's time 48 per cent was allowed, but by the time of Justinian this had been reduced to 6 per cent. Some idea of percentage appears in the *usuræ centesimæ*, or 1 per cent per month. The "id quod interest" of the Middle Ages came in the thirteenth century to be agreed to in advance, and Leonardo of Pisa (see Fibonacci) gives problems involving 20 per cent. Matthew Paris says that in his time 10 per cent was exacted every two months, and that thus the unscrupulous "circumvented the needy in their necessities, cloaking their usury under the show of trade." The supposed antagonism of the canon law to all forms of interest was seriously questioned in the fifteenth and sixteenth centuries (as by Franciscus de Platea, *Opus de restitutionibus usurarum et excommunicationibus;* Johannes Nieder, *Tractatus de contractibus mercatorum*, and others), and as a result the subject appears in many of the early printed arithmetics. For example, Calandri (1491) speaks of lending money "per 3 anni a 10 per cento lanno." Some of these writers introduce the subject under protest, as a "diabolical" one, as in the case of Cataneo (1546), Gemma Frisius (1540), and Pagani (1591). From that time to the present, the topic has appeared in practically all arithmetics.

Compound interest was known to the Romans, and was not forbidden by the earlier laws. It appeared in printed arithmetics in the sixteenth century as interest "à capo d' anno" (compounded from the first of each year), and "à capo d' alcun tempo" (compounded from the beginning of some other fixed period). From the Italians the latter passed over to the French as "merite à chef de terme" (Trenchant, 1566), and to the Dutch as "interest op interest." It was unjustly charged that compound interest was chiefly used by the Hebrews ("vsitato da gl'hebrei ne suoi Banchi," as Pagani writes in 1591), and it was occasionally called by their name ("che chiamano Giudaica," as the Italian edition of Gemma Frisius misspelled it in 1567; "Een Ioodtsch profijt," as Vander Schuere gave it in 1600).

The method of reckoning simple interest has never been settled. The year is about 365¼ days long, and hence there is practically no such thing as exact interest. For convenience 360 days are taken for the year in ordinary computations, and 365 days for more accurate work. Tables were early constructed to facilitate computation, and they appear in many of the first printed arithmetics.

As an educational topic, interest usually appears among the early applications of percentage. The subject has become unduly complicated in the schools through the elaboration of problems requiring the finding of the time, rate, or principal. The chief emphasis should always be laid upon the finding of the interest, the other cases demanding relatively little attention.

The growth of banking facilities has developed short-term notes to such an extent that the subject as formerly taught is losing much of its practical value. Interest is now commonly paid every thirty, sixty, or ninety days, or else every year, and we may reasonably expect a gradual simplification of the subject as taught in the schools. D. E. S.

INTERFERENCE OF HABITS. — Mental processes of all types are so interrelated that no single phase of mental life can develop without influencing all of the other types of activity. The same is true in general of the physiological processes of body activity. Thus, if one moves a certain portion of the body, the circulatory system responds by abstracting blood from other parts of the body and sending it to the exercised region. If now the individual trains himself so that a certain portion of his body, or a certain type of thought, is highly cultivated, he may thereby interfere with an equally high development of other phases of his nature. Examples of interference of mental habits can readily be drawn from ordinary experience. The individual who is very much interested in natural objects is not likely to develop an equal degree of interest in literary forms. The individual who has learned one form of handwriting cannot so readily take on another type. In short, the negative side of habit cultivation is one which deserves very full recognition in educational discussions. Whenever a habit has been perfected, the possibilities of developing other habits are correspondingly curtailed. When two habits must be cultivated side by side and mutually interfere with each other, they require more exercise for their perfection than would be required for a single habit unaccompanied by the interfering type of activity. The whole matter here under discussion relates itself to the problem of formal discipline (*q.v.*). C. H. J.

See HABIT.

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INTERFERENCE TONE. — See COMBINATION TONES.

INTERMEDIATE GRADES. — The middle grades of the elementary school, always the fourth and fifth, and sometimes inclusive of the third or sixth grades. H. S.

See ELEMENTARY SCHOOLS, PRIMARY GRADES; GRAMMAR GRADES, GRADING AND PROMOTION.

INTERMEDIATE HIGH SCHOOL. — A term applied, in a few cities, to a school intermediate between the elementary school system and the high school proper, and including parts of each. The city of Berkeley, Cal., offers a good illustration of the use of the term. Here the first six years of the elementary school system are taught by grade teachers, and along grade lines. The seventh, eighth, and ninth years are grouped together, in separate buildings, termed Intermediate High Schools, and are taught by teachers who have had college training, and on the departmental system. (See DEPARTMENTAL SYSTEM.) The course of instruction during these years is materially enriched, and certain options are offered. These schools also serve to make the transition to the high school easier. The tenth, eleventh, and twelfth years then constitute the regular high school. The plan serves also to relieve the pressure for seating space in both the elementary schools and the high schools, as two or more intermediate high schools may be provided for in different parts of the city, and these serve to take two grades out of each elementary school and one out of the high school. While not saving anything in classrooms, it provides better for the educational needs of the city. The main argument for the plan, however, lies on the educational side. E. P. C.

See HIGH SCHOOLS, SIX-YEAR.

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INTERMEDIATE SCHOOLS. — See ELEMENTARY SCHOOLS; GRAMMAR GRADES; INTERMEDIATE HIGH SCHOOL; GERMANY, EDUCATION IN, under Middle Schools.

INTERMISSION. — See RECESSES; SESSION, LENGTH OF.

INTERNAL SPEECH, INNER SPEECH. — The efforts to carry on ideational processes are accompanied by certain incipient contractions of the vocal organs. These incipient contractions of the vocal organs can be shown to be of the highest importance in the formation of ideas. Whenever they are interrupted, the individual is handicapped in memory and in clearness of recognition. The distinction between internal speech and ordinary speech is not great in a child. Here the tendencies are always strong toward external, complete expression; but as development goes forward the individual suppresses more and more the grosser forms of activity, and carries on his mental processes with the aid of internal speech alone. C. H. J.

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INTERNATIONAL CONGRESS IN PEDOLOGY. — See PARENTHOOD, EDUCATION FOR.

INTERNATIONAL CONGRESS OF HOME EDUCATION. — See PARENTHOOD, EDUCATION FOR.

INTERNATIONAL CONGRESSES OF EDUCATION. — Educational congresses have been held in connection with practically all the international expositions (*q.v.*) of the last half century. There was an educational conference in connection with the international exposition held at London in 1851, at which representatives from Germany, France, and the United States joined English educators in the discussion of the educational aspects of the exhibits and other topics of international interest. The recently organized kindergarten (*q.v.*) in Germany was one of the subjects discussed at the London conference. Americans who participated in this conference were Henry Barnard, Walter R. Johnson, and Mrs. Emma Willard (*qq.v.*). There were also conferences on elementary, secondary, and higher education at the Paris expositions of 1855 and 1867. President F. A. P. Barnard (*q.v.*) was the official representative of the United States at both congresses. Somewhat broader in scope and more international in character was the conference held at the Vienna exposition of 1873. The various phases of infant education and child welfare — the crèche, the *salle d'asile,* the kindergarten; the care and training of defective children — the blind, the deaf, and the feeble-minded; elementary education; school gardens, and sex in education were among the subjects presented. The United States was represented by John Eaton, John D. Philbrick, and Edward Seguin (*qq.v.*).

Four international congresses of education have been held in the United States, — Philadelphia, 1876; New Orleans, 1885; Chicago, 1893; and St. Louis, 1904. At the international conference on education held in connection with the exposition which celebrated the first anniversary of American Independence, thirteen foreign countries and most of the states of the American Union were represented. Sir Richard Barry of Australia presided, and Commissioner of Education John Eaton organized the program, which included ten topics for discussion, — courses of study, methods of instruction, supervision of schools, pedagogical museums and exhibits, technical education, training of teachers, the kindergarten and elementary schools, university and professional education, and the education of women.

The third Paris conference was held in connection with the international exposition of 1878. Besides the general congresses there were numerous special conferences on the education of the blind and deaf, technical and industrial education, etc. The United States was represented by John D. Philbrick, James P. Wickershan, and F. A. P. Barnard (*qq.v.*).

There was also a general conference on education at the Brussels exposition of 1880, at which William T. Harris represented the United States.

The second American congress was held in connection with the international cotton exposition at New Orleans, February, 1885. John Eaton, Commissioner of Education, presided. Besides the general meetings, there were departmental meetings devoted to elementary, secondary, and superior instruction, school architecture and hygiene, care and training of defective, dependent, and delinquent children, national aid to education, care of the Indians, and educational journalism. The fourth Paris congress was held in 1889, at which M. Gréard (*q.v.*) presided. There were three general congresses of education — primary, secondary, and superior instruction — and six special congresses — physical education, commercial and industrial education, psychology, mathematics, and chemistry.

The third American congress was held at Chicago in 1893 in connection with the Columbian exposition and under the auspices of the National Education Association (*q.v.*). William T. Harris presided. Besides the general sessions there were fifteen departmental congresses, including higher, secondary, and elementary education; experimental (genetic) and rational psychology; school supervision; manual training; the kindergarten; training of teachers, and educational journalism. Most of the countries of the world were represented. The fifth and last Paris congress was held in 1900. It included practically every phase of educational activity, and conferences (more than twenty) were in session for two months.

The fourth American congress was held at St. Louis, September, 1904. Its purpose was to "bring to the consciousness of the world the too much neglected idea of the unity of truth." In consequence the congress was organized into seven general divisions — normative science, historical science, physical science, utilitarian science, mental science, social regulation, and social culture. These divisions were again subdivided into a great number of departmental conferences (128 in all), in each of which the fundamental methods and the progress of the century formed the basis of the addresses. A second international congress of education was held at Brussels in 1910. Besides the general congress on popular education there were numerous departmental congresses.

In addition to these general congresses of education, there have been a number of special congresses, such as the International Congress of Home Education, with meetings at Liège in 1905, Milan in 1906, and Brussels in 1910; the International Congress of School Hygiene at Nuremberg in 1904, London, 1907, and Paris, 1910; the International Congress of Psychology at Paris, 1889, London, 1892, Munich, 1896, Paris, 1900, Rome, 1905, and Geneva, 1909; the International Congress of Technical Education at Bordeaux, 1886, Paris, 1889 and 1900, London, 1897, and Brussels, 1910; International Congress of Educators of the Deaf at Paris, 1878 and 1900, Milan, 1880, Brussels, 1883, Chicago, 1893, and Edinburgh, 1907; and International Congress for the Education of the Blind at Paris, 1900, Brussels, 1902, Naples, 1909, and Cairo, 1911.

W. S. M.

See Expositions, International, and Education.

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INTERNATIONAL EXCHANGE OF TEACHERS AND PROFESSORS. — See Teachers and Professors, International Exchange of.

INTERNATIONAL LAW — See Political Science.

INTERNATIONAL PEACE, EDUCATIONAL ASPECTS OF. — See Peace, Educational Aspects of.

INTERNATIONALISM, FOUNDATION FOR THE PROMOTION OF, THE HAGUE, HOLLAND. — The main purpose of this Foundation, organized in 1910, is to promote internationalism in movements for intellectual and social progress, and is part of the broader movement for world's peace. It aims to establish permanent international organizations dealing with related problems and grouped according to related interests. Three such bureaus already exist: Bureau de la Commission permanent des Congrès internationaux de Médicine (1909); Bureau permanent de la Fédération international de Pharmacie (1910); and the Bureau permanent de l'Institut international de Statistique (1912). Other bureaus are contemplated for pure science and letters, hygiene, and technology. The leading spirit in the movement is Dr. P. H. Eijkman, director of the Preliminary Office of the Foundation and author of *L'Internationalisme médical* and *L'Internationalisme scientifique*.

See Scientific Societies.

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INTERPRETATION. — Every impression has added to it in individual experience certain meanings, which are derived through comparison and memory. These added phases of experience which enlarge the significance of a given impression are called interpretations. Whenever, therefore, an impression is enlarged upon through mental activity we have an example of interpretation. In common usage, this term is employed to cover such cases as translation of a passage from a foreign language where the additional factors are the elements of the vernacular which are used to explain the foreign terms. An example of psychological meaning is that of a sound which in addition to being heard is amplified by association and understood as a word. C. H. J.

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Stout, G. F. *Manual of Psychology*, Bk. II, ch. ii. (New York, 1899.)

INTERVAL. — The lapse of time between one event and another is known as a temporal interval; the qualitative difference between one tone and another is known as a tonal interval; distance in space is designated a spatial interval. In general, any transition from one point to another involves the traversing of an interval. C. H. J.

INTERVAL. — See Musical Terms.

INTOXICATION. — In the broadest sense any kind of poisoning; usually restricted to the mental and physical effects following an overpowering dose of poison, and popularly used to designate the mental condition following the continued or excessive use of alcoholic liquors.

Two kinds of intoxication are recognized: that of endogenous and that of exogenous origin. Endogenous intoxication is due to the poisons (toxins) manufactured within the body by its different organs, such as those of faulty metabolism from disease of the liver or of the gastro-intestinal tract, and the condition is then known as or called autotoxic. The exogenous intoxications are due to the introduction into the body of substances that act deleteriously upon the organs, and especially upon the nervous system. Intermediate between these two kinds of intoxication are the intoxications due to toxins produced by micro-organisms. In this form of intoxication the micro-organisms are introduced from without, but the formation of the toxins takes place within the body. Because of the latter fact these intoxications are usually classed with the endogenous.

Endogenous Intoxication. — Normally, digestion is the chemical breaking up of the food into simpler compounds that may be absorbed and utilized for the upbuilding and the repairing of the body. Abnormal conditions occur, however, in which the chemical division of the food does not stop when the food is fit for bodily consumption, but continues to the elaboration of some products that are deleterious to the organs. With the normal working of the kidneys and the liver most of these products are taken care of, are rapidly changed into innocuous compounds and excreted. In the normal working of the body tissues are broken down and the metabolic products are eliminated through the joint action of the kidneys and the liver. It requires the normal activity of both of these organs, and of many others, to keep the body in a normal chemical condition, and if these organs be diseased, there may be too great a formation or a lack of elimination of the waste products, with the result of poisoning all the tissues. This is in an autotoxic condition.

The auto-intoxication effects from diseases of the thyroid glands are well recognized. The congenital absence of the gland is productive of imbecility (*q.v.*) of the form known as cretinism (*q.v.*). In exophthalmic goiter hallucinations and states of anxiety and of agitation are found. In myxœdema, the mental symptoms are stupidity, apathy even to the degree of complete dementia, attention, apprehension, association, and memory defects. In this connection it is worthy of note that Kraepelin at first grouped dementia precox with thyreogenous insanity, and there have been repeated attempts to explain all the symptoms in dementia precox from an autotoxic standpoint.

Exogenous Intoxication. — Most drugs, when taken in sufficient quantities, produce mental and physical symptoms that may be called intoxications. Certain drugs have this property more than others and are called intoxicants, hypnotics, narcotics, and anæsthetics. (See Anæsthesia.) Among these we find ether, chloroform, chloral and its derivatives, sulphonal, trional, paraldehyde, urethane, veronal, hedonal, ethyl and methyl alcohols, and nitrous oxide. Opium and its derivatives (*e.g.* morphine), cocaine, atropine, hyoscine, salicylates, mercury, lead and many other substances give similar symptoms of intoxication. Some of these produce intoxication effects only after long-continued use, and the effects are somewhat similar to those of chronic poisoning. Lead poisoning may result in a condition similar to that of alcohol. Hallucinations, agitation, anxiety, incoherence, disorientation, and intellectual defects may be present. Morphine brings about hyperæsthesias, hallucinations, slow and slightly incoherent mental state, but usually memory is not impaired. For the effect of alcohol see Alcohol, Use and Psychological Effect of.

Although most of the intoxications of exogenous origin are found in adults, it should be remembered that children may be similarly affected. The use of soothing syrups, of certain patent medicines, and even of physicians' prescriptions containing any of the drugs mentioned above may produce intoxication. It is well known that soothing syrups contain morphine in some form, and once the habit is formed in a child we have a condition similar to that of the adult morphine fiend. Many patent medicines contain alcohol, and from their use (or abuse) there may result an alcohol intoxication, usually of a chronic nature.

Whenever a child exhibits any degree of stupidity, of incoherence, or of agitation, and always when hallucinations are present, a careful examination regarding the food and drink should be made. Special attention should be paid to the quantity of candy and its nature, for it is known that alcohol may be formed in the intestine from ingested sugar, and it may be introduced in the form of "brandy drops," which are not uncommonly sold to children. Lead in toys and in drinking water is another common intoxicant, but the symptoms are usually chronic. S. I. F.

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INTROSPECTION. — This is the method of psychology whereby the individual observes his own internal mental processes. For example, one has a feeling of pleasure, and when he notes this fact and observes its character he is introspecting his own mind. Attention has always been called to the difficulties of such introspective observation. The will to turn one's attention upon one's self interferes with the normal flow of normal processes. Most introspection is therefore retrospection. Formerly it was said that introspection was the only method of psychological investigation. With the development of experimentation in psychology it has become obvious that one can study the mental activity of another individual without coming into direct contact with the inner mental processes involved. C. H. J.

See Psychology.

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INTUITION. — A name given to direct, as distinct from mediate or logical knowledge. In the history of thought two types of intuition have been discriminated: sense perception and rational perception. With respect to the former, the chief problem has been whether it is in and of itself a mode of knowledge, or whether it is a mode of judgment, that is, of inferential interpretation. If the former, there is such a thing as knowledge without thinking; in the latter case, the instantaneous character of a perceptual intuition expresses the fact that recurring previous inferences have finally formed an automatically operative habit. The perception is then, in its strict sense, a *re*-cognition, a knowing in terms of prior knowings that involved judging. In this controversy, the party that held that perception was acquired rather than primitive intuitive knowledge is admitted to have been successful. However, as far as the philosophical point at issue was concerned, this conclusion was offset by recourse to sensation as a substitute form of immediate knowledge. The doctrine of rational intuition was first systematically developed by Plato. He felt the need of some way of knowing which should combine the rationality of discussive, or demonstrative, knowledge with the directness and vitality of pure immediacy. So he introduced the conception of a face-to-face perception by pure reason of ultimate absolute essences (see Idea). This intuition involved a mutual interpenetration of knower and known and an assimilation of the former to the latter. This motif was developed by the Neo-Platonists in their conception of an ecstatic vision transcending all logical categories, and by the mystic school of Christian theologians in the idea of the beatific vision of God.

In the Platonic tradition rational intuition was an envisagement of absolute reality, and implied a quasi-mystic factor. After the collapse of the doctrine of innate ideas (*q.v.*) the rationalistic anti-mystic school introduced the idea of rational intuition of abstract truths, like those of morals and mathematics. This doctrine of an immediate certitude of first and necessary truths became the bulwark of the Scotch school in opposition to the skeptical turn given empiricism by Hume. Kant employed the notion of an intuitive understanding as an ideal of knowledge, unattainable but useful in providing a limiting notion by which both sense perception and reflective judgment could be criticized and their pretensions to yield more than relative knowledge exposed. In contemporary thought Bergson has introduced an interesting variation of the idea of rational intuition. According to him, logical or discursive intelligence has been evolved in the interests of action, and is accordingly quite unadapted to the speculative task of grasping Reality in itself. Intelligence and instinct represent, however, diverging lines of evolution out of a common reality; while a sort of vague penumbra of instinct still surrounds the clear-cut outlines of intellectual knowledge. By retracing that phase of the evolution of reality which has taken the road of instinct, human beings may by an extreme effort of will bring about a fusion of intellectual results with the residual penumbra of instinct they still directly possess, and thereby secure at least a fleeting glimpse of the inner creative impetus of reality itself. J. D.

See Empiricism; Idea; Innate Idea; Mysticism; Neo-Platonism; etc.

INVENTION. — A general term referring to that type of mental activity whereby one departs from experience which he has had and works out a novel combination. (See Imagination; Ideas.) In its usual form invention realizes itself in the construction after the pattern of the mental recombination of some external mechanism. Thus, the inventor of a machine, after working out the relations between the parts of the machine in his mind, realizes his ideas in some actual construction.

Royce has shown that the range of individual possibility of invention seems to be limited by certain habits of the individual's life. One cannot deliberately invent a new form without exhibiting his natural tendency to operate within a fairly limited range of possible forms. That individual who is capable of the largest number of unique combinations is said to be most inventive. His mental activities are closely related in type to biological variations (*q.v.*). C. H. J.

See Genius; Imagination; Imitation.

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Royce, J. *Outlines of Psychology*, ch. xiii. (London and New York, 1903.)

INVENTIONAL GEOMETRY. — A term rather loosely used in the United States to designate an introduction to elementary geometry, the pupil being led to discover for himself the theorems he is to prove, and to invent the proofs. It is substantially the same as the heuristic teaching of the beginnings of geometry in the German schools. The Germans have an expression, *Vorschule der Geometrie*, that happily represents this initial stage. In this are developed the fundamental concepts of plane and solid geometry, and the mensuration of the simplest forms. This is followed by easy propositions relating to angles and triangles, with simple constructions by the aid of the ruler and compasses. This is taken up in the spirit suggested by the name Inventional Geometry. The latter term is not a fortunate one, since it gives the impression that it refers to a kind of geometry different from that of the secondary school, as is the case with the projective and descriptive geometries, when it really refers only to a method of teaching a part of that geometry to young pupils. For this reason it is not liable to be used extensively. The spirit suggested by the term is, however, worthy of serious attention. Up to the present time the work in geometry in the elementary grades has been little besides mensuration, and under the present school conditions there is not likely to be any change in this limitation. With departmental teaching in grades seven and eight it would be quite possible to introduce the German plan.

Inductive geometry is, as the term indicates, substantially synonymous with inventional geometry as it is usually considered. The first steps in any science may properly be inductive, leading to the discovery of probable truths. This should be followed by the deductive stage in which the probable becomes the veritable. D. E. S.

INVOLUNTARY ACTION. — That form of behavior in which no conscious choice or deliberation is present.

See Will.

INVOLUTION. — The operation of raising a number to a power. The word comes from the idea of rolling or involving a number into itself by means of multiplication, and was not common until rather recently. The earlier arithmetics proceed at once to Evolution (the extraction of roots) without any preliminary work on Involution. Thus in *De Arte Supputandi* of Tonstall (1522), division (*De partitione*) is followed by roots (*De qvadrati et cvbi lateribvs investigandis*). The reason for the presence of a chapter on Involution in arithmetic is to be sought in the reflex influence of algebra on the subject. There is no need for the word in elementary arithmetic, nor for any more than a passing reference to the subject, together with the expansion of $(a + b)^2$, if square root is to be studied, and of $(a + b)^3$, if cube root is included. It may confidently be expected that the topic will cease to have any separate treatment in elementary arithmetic. D. E. S.

IOWA, STATE OF. — Originally a part of the Louisiana purchase, and organized as a part of the Territory of Missouri in 1812, Michigan in 1834, Wisconsin in 1836, and as the separate Territory of Iowa in 1838. It was admitted to the Union in 1846 as the twenty-ninth state. It is located in the western portion of the North Central Division, and has a land area of 55,475 square miles. In size it is one fourth larger than Pennsylvania, and nearly as large as the six New England states. In 1910 Iowa had a population of 2,224,771 and a density of population of 40.01 persons to the square mile.

Educational History. — The first school in Iowa was taught in 1830, near the present site of Keokuk. By the time of the organization of the territory in 1838 some forty schools were in existence in different places. All of these were private or subscription schools. The first school building, a combined church and schoolhouse, was erected near Dubuque in 1833. By the time of the admission of Iowa in 1846, there were one hundred log schoolhouses in the state. In January, 1838, five seminaries were chartered for Iowa by the Wisconsin Territorial Legislature, but no means of maintaining these schools was provided. Two colleges were also chartered at the same time. The first legislature under the territory of Iowa enacted the first school law in 1838. This provided for the formation of districts, the establishing of schools, and authorized the voters of each district to levy taxes for schools up to a total of five mills and $10 per person. The second legislature in 1840 enacted a law which made provision for free public schools, but the law was in advance of public sentiment, and practically remained a dead letter. The census of 1840 reported but one academy and sixty-three common schools in the territory. In 1841 the office of Territorial Superintendent of Public Instruction was created, but the superintendent made but a single report, and the office was abolished the next year. Though the territorial governors urged important action, little was accomplished during the territorial period.

The state constitution of 1846 made careful provision for the establishment of a system of state schools. A Superintendent of Public Instruction was provided for, to be elected for three-year periods by the people; the General Assembly was instructed to provide for a system of common schools by which a school should be kept up and supported for three months in each school district each year; and the school and university funds were enumerated and declared perpetual funds, the income only to be used. At the time of admission to the Union there were 416 school districts in the state. The law of 1847 made partial provision for carrying out the instructions of the constitution. The election of a Superintendent of Public Instruction was provided for, who was to look after the school fund and report to the legislature; means of organizing school districts, electing directors, raising funds for schoolhouses, the inspection of schools, and the examination of teachers by the inspectors were also provided for. School fund commissioners were to be appointed in each county to manage the county's share of the school fund and to report to the State Superintendent. In 1848 the legislature authorized a district tax both for schoolhouses and support, and in 1857 towns and cities were authorized to provide a graded school system, including schools in which languages other than English might be taught, and to levy a tax up to five mills therefor. Notwithstanding these efforts, the schools continued to be supported in large part by the rate bill until 1858, when they were made free; while inspection and examination of teachers existed little more than in name. In 1857 there were 3265 school districts in the state.

In 1857 a new constitution was adopted which made detailed and very advanced provision for a strong state school system. The constitutional provisions relating to education were divided into two parts. The first made detailed provision for a State Board of Education, to be elected by the people, and constituted it a legislative body with power to make laws and rules and regulations for the schools, levy taxes, make appropriations, and to appoint a Secretary, who was to supersede the Superintendent of Public Instruction and act as the executive officer of the board. This board was charged with the duty of providing for a system of common schools whereby a common school should be kept up in each school district at least three months each year. A final clause gave the legislature power at any time after the year 1863 to reorganize the board and abolish its legislative functions, and this was done in 1864. The second part of the article on education made detailed provision for the care of the school lands and school funds, provided for its increase, and for the distribution of its income. In the preceding year the Governor of the state had been authorized to appoint a commission to revise the school laws of the state and to provide an efficient school system for Iowa. Horace Mann and the Chancellor of the State University, Amos Dean, were the two commissioners who framed the report. The commission submitted their recommendations in the form of a bill, December, 1856, but it was not until early in 1858 that any action was taken. The recommendations were then enacted into law by both the legislature and the new Board of Education. The "rate" was abolished, and the schools were made free to all the children in the state; the office of county superintendent was established for the examination of teachers and the visitation of schools; county institutes were to be established and to receive aid; county high schools were authorized; and the township was made the unit of organization, and the school districts were reduced to subdistricts. Later, in 1858, cities and towns were allowed to organize into independent districts, and since then this objectionable permission has been extended and extended, until now any village of 100 residents may segregate itself and form an independent district, and thus escape the burden of general taxation. From 334 independent districts and 1176 school townships in 1870, the number has increased to 3766 independent districts and 1182 school townships in 1905. The new law of 1858, providing for taxation for free schools, was enacted at a time of great financial stringency, when the people found it difficult to accept any new financial burdens, and the new legislative State Board of Education did a valuable service, during the few years of its existence, in steadying affairs and in upholding the new law until the people could get used to it and accept it. In 1864 the board was abolished and the office of State Superintendent of Public Instruction was revived. This law marks the establishment of the present school system, the changes since then having been nearly all in the nature of the expansion and development of the system.

In 1847 the State University had been founded, and in 1868 the Agricultural College was opened. In 1849 the first permission to form higher grades in schools had been granted; in 1851 the first graded school had been organized; and in 1870 the County High School Law was passed. In 1868 the standards for certificating teachers were raised, and in 1882 a State Board of Examiners was created and state teachers' certificates authorized. In 1876 women were made eligible to hold school offices, and in the same year the state normal school was established. In 1896 school corporations were authorized to provide free textbooks if permitted to do so by vote of the people. In 1882 Arbor Day was instituted. In 1906 a compulsory education law was enacted. In 1911 the consolidation of schools and the transportation of pupils, free high school tuition, and county teachers training classes were provided for.

Present School System. — The school system of Iowa, as at present organized, is as follows: At the head is a State Superintendent of Public Instruction, elected by the people for two-year terms. He is charged with the duty of preparing and distributing courses of study for the rural and high schools of the state; of collecting and publishing certain kinds of statistical information; of preparing questions for the use of county teachers' examinations and grading the papers; of rendering opinions and determining appeals from the decisions of the county superintendents; of calling the county superintendents together in convention; of designating a time and place for holding county institutes and approving the conductors selected; and of making an annual report to the Auditor of State and a biennial report to the Governor. His salary is $2200, with $300 for traveling expenses. He is also *ex officio* a member of the State Educational Board of Examiners and president of the board; of the board of regents of the state university; of the board of trustees of the State College of Agriculture and Mechanical Arts; and of the board of trustees of the state normal school, and president of this board.

The State Educational Board of Examiners is the nearest approach to a State Board of Education that Iowa has had since the abolition of that board in 1864. It was established in 1882 to hold examinations for state teachers' certificates, and is composed of the State Superintendent of Public Instruction, the president of the state university, the principal of the state normal school, and two persons appointed by the Governor for four-year terms, one of whom must be a woman. They are charged with the duty of holding two examinations annually for state certificates and state diplomas; they may issue special certificates for special lines of work; and may validate certificates from other states if these have been issued on equivalent requirements. This board is also a board of inspection and supervision of schools for the training of teachers, approving institutions, and providing rules for the certification of graduates of the approved institutions. The board also makes out lists of books for which the library fund may be spent by the School Directors of the state.

For each county a county superintendent is elected by the people for two-year terms. He is to serve as a means of communication between the State Superintendent and the township or district school authorities; must visit the schools of the county; must hold four examinations for county teachers' certificates each year, using questions prepared by the State Superintendent, and transmit the answer papers, with his opinions and impressions, to the State Superintendent for grading; may conduct a special examination with the permission of the State Examination Board, if there should prove to be a shortage of teachers for the county; must conduct an annual county teachers' institute; must see that all school laws are enforced; and must make an annual report to the Superintendent of Public Instruction. To qualify for the office, a county superintendent must hold a first-grade county teachers' certificate, a state teachers' certificate, or a life diploma. The salary is $1250 a year for all counties. There also exists in each county a rudimentary type of a county board of education, consisting of the county superintendent, the county auditor, and the county board of supervisors. The duty of this county board seems to be only to submit the question of county uniformity in school textbooks to the voters of the county, when petitioned to do so by one third of the school directors of the county, and to adopt uniform textbooks for the county in case the voters decide that they want county uniformity.

Aside from a certain centralized control over teachers' institutes, and the examination of teachers, Iowa may be said to represent a decentralized system, somewhat analogous to that of certain New England states, as the greatest power and authority is in the hands of the township and district school corporations. Each congressional township was created a school township by the law of 1858, but since then great numbers of independent districts have been organized. While the township is nominally the unit of organization, with subdistricts, as a matter of fact, any city, town, or village having 100 residents, and any rural subdistrict may be set off as independent school districts, having their own board of school directors, escaping township taxes, and managing their own affairs, subject only to the control of the county and state superintendents, as enumerated above. This is the weakest feature of the Iowa school system. Subdistricts and townships hold annual school meetings. Women are eligible for school offices, and may vote on all questions relating to taxes and the voting of bonds. Subdistrict annual meetings have the power to elect a member of the board of school directors, and to vote extra subdistrict taxes for maintenance or for schoolhouse purposes. The township annual meeting has power to direct a change of textbooks; to provide for free textbooks; to add to the branches of instruction; to sell, lease, or let school property; to authorize the construction of roads to the schoolhouses; and to vote bonds and a schoolhouse tax up to ten mills. Township boards are required to take an annual school census in June; to notify the county superintendent when the schools are to begin; to determine the amount of the teachers' and contingent fund necessary, and to notify the county board of supervisors, whose duty it is to levy it; to prescribe the course of study for the schools; to care for the school property, locate schoolhouses, determine what schools pupils may attend and fix the length of term; to carry into effect the legal instructions of the annual school meeting; to elect teachers and dismiss them for cause; to designate school visitors from among their own number; and to make an annual financial report to the annual meeting and to the county superintendent. Boards of directors may also contract with other corporations to teach children if more convenient, or may furnish transportation, if cheaper, either within or without the township; may establish graded union or high schools, of their own volition; may establish kindergartens and employ a township superintendent; may petition the county superintendent for a vote on county uniformity and free textbooks; may authorize each director to furnish fuel, supplies, and a teacher for his subdistrict; must expend between five and fifteen cents per pupil for the school library each year, and may expend up to $25 per school per year for library and apparatus; may appoint a truant officer; may contract for all the textbooks used in the schools and buy and sell them to the pupils at cost, furnishing free books to indigents, or they may furnish them free to all pupils and pay the expense out of the township contingent fund, if so directed by the annual school meeting. The treasurer of the board of directors receives all money due the township or district and pays the same out on the order of the president and secretary of the board.

School Support. — At the time of its admission into the Union, Iowa received the sixteenth section in each township, or a total of 905,134 acres from the government, for the benefit of common schools. The 500,000 acres of land granted to new states, some saline lands, 5 per cent of the sale of United States lands within the state (after 1857), and the net proceeds of the estates of persons dying without will or heir have been added to the permanent fund. The lands have all been sold, and a fund of about four and three quarter millions has been produced. The income on this was $214,132.30 in 1905, and remains nearly constant from year to year. This is equal to about thirty cents per census child, five to twenty-one years of age, and is distributed to the counties by the State Auditor on this basis. No state school tax is levied or appropriated. The only state grant for education, aside from the appropriations for the support of the higher educational institutions, is a grant of $50 per county each year for the benefit of county institutes.

In each county a county school tax of not less than one nor more than three mills must be levied for schools, and the proceeds of this tax together with the income from the state school fund and the net proceeds of all fines collected for breaches of the penal laws, is distributed by the county auditor to the different school corporations of the county wholly on the basis of the school census. Each school corporation raises the balance of the money needed to maintain its schools by local taxation. When a district or town withdraws from the township organization and sets up an independent district, this action renders void any tax previously levied on the new independent district. The result of this is to effectually prevent any equalization of school burdens, as the wealthier subdistricts can escape all general taxation except the county tax. The local tax for contingent funds is limited to $5 per census child and not over $75 per school, and the local tax for teachers' salary fund is likewise limited to $15 per census child or $175 per school. Low teachers' wages are the result of such limitations.

Educational Conditions. — The state is essentially rural and agricultural, and the large number of small schools which must be maintained is probably the cause of the low expenditure. Of the total population about 75 per cent live in country districts, and only about 16 per cent lived in the seventeen cities of over 8000 inhabitants. Of the total population 99.4 per cent are white, and about 85 per cent are native born. The foreign-born are chiefly Germans, Scandinavians, and English. The state consequently has no negro problem or foreign problem to deal with. The percentage of illiterates in the total population, ten years of age or over, was but 2.3 per cent, which, with Nebraska, was the lowest of any state in the Union. The compulsory attendance law requires that all children between seven and fourteen must attend school for sixteen weeks if physically and mentally capable and if living within two miles of a schoolhouse. Private and parochial schools must make attendance reports. Any school corporation may appoint a truant officer, but the means provided for enforcing the law are not such as to ensure any adequate enforcement.

In addition to the regular elementary school instruction, a number of counties provide some instruction in agriculture; about thirty cities and towns maintain kindergartens; a rapidly increasing number report instruction in manual training; and in domestic science. School libraries exist in all schools, and each school corporation must devote from five to fifteen cents per census child to the purchase of books for the school library. The law provides that the Bible shall not be excluded from the schools of the state, or from any state institution, and readings from the Bible with a repetition of the Lord's Prayer by the teacher and school is authorized.

Teachers and Training. — The state maintains one large and well-organized normal school for the professional training of teachers, which has a little over 200 graduates annually. In addition to the state normal school, a number of colleges assist the state in the preparation of teachers, being accredited for this purpose by the State Educational Board of Examiners, which is authorized to inspect and accredit such institutions, and to determine the conditions under which the graduates of these institutions may receive teachers' certificates. Normal training classes in high schools were authorized in 1911, and in time they will add materially to the number of trained teachers in the state. All teachers' certificates are issued by the state.

Secondary and Higher Education. — Graded schools and high schools are to be found in all the cities and larger towns, and also in many of the independent districts and consolidated townships. The state is well supplied with high schools. No state or county aid is given to them, each being maintained by local taxation. Although provision exists in the law for forming county high schools, few have been formed, and the law has not been regarded as successful.

The University of Iowa (*q.v.*) at Iowa City, opened in 1855, and the Iowa State Agricultural College (*q.v.*) at Ames, opened in 1868, form the culmination of the public school system of the state. The state also maintains the Iowa Industrial (reformatory) School for Boys at Eldora; the Girls' Industrial (reformatory) School at Mitchelville; the Iowa College for the Blind at Vinton; the Iowa School for the Deaf at Council Bluffs; and the Iowa Institute for Feeble-Minded Children at Glenwood. E. P. C.

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IOWA COLLEGE, GRINNELL, IA. — See Grinnell College, Grinnell, Ia.

IOWA STATE COLLEGE, AMES, IA. — An agricultural and mechanical arts college for men and women founded by act of the state legislature in 1858. In the following year a farm of 640 acres was purchased for the use of the college. In 1862 the General Assembly accepted the land grant offered by Congress for the establishment of agricultural and mechanical arts colleges. By a state act of 1882 provision was made for giving a necessary liberal education in addition to the purely specialized courses. The entrance requirements are fifteen units. The college offers four five-year courses in engineering and fourteen four-year courses in engineering, the different branches of agriculture, veterinary medicine, general science, and home economics, all leading to degrees. The faculty consists of eighty-eight professors; there are eighty-four instructors and assistants. In 1911, 2307 students were enrolled in different courses, including short winter courses and music.

IOWA STATE UNIVERSITY, IOWA CITY, IA. — A coeducational institution forming an integral part of the public educational system of the state. An act establishing the university in Iowa City was passed in 1847, but the opening was postponed until 1855. Until 1860 only a normal department was maintained. Subsequently the following departments, now colleges, were added: law (1868); medicine (1870); homœopathic medicine (1876); dentistry (1882); pharmacy (1885); graduate (1905); applied science (1905). Since 1909 the university, together with the State Teachers' College and the State College of Agriculture and Mechanical Arts, is under the control of the State Board of Education. The university plant consists of thirty buildings on a campus of fifty acres. The income is derived from invested funds and state appropriations. The university was among the first to organize university extension courses in different parts of the state, a movement which has met with success. Students are admitted on satisfying the entrance requirements of fifteen units. The usual university degrees are granted by the institution. The total enrollment in all departments in 1909–1910, including summer session, was 2352. The faculty consists of sixty-nine members of professorial rank and 150 instructors of other grades.

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IOWA WESLEYAN UNIVERSITY, MT. PLEASANT, IA. — A coeducational institution founded in 1842 as the Mt. Pleasant Collegiate Institute; the present title was adopted in 1854. It is under the auspices of the Methodist Episcopal Church. The university maintains an academy, college of liberal arts, normal, music, and commercial departments. The entrance requirements are fifteen units. The college, on the completion of appropriate courses, grants the degrees of A.B., B.S., and Ph.B. There is a faculty of twenty-eight members.

IRELAND, EDUCATION IN. — Early History. — *Under the Druids.* — In the most valuable information given by Cæsar about the druids (see DRUIDS, SCHOOLS OF THE) there is much which may be almost certainly transferred to the earliest teachers and schools of Ireland. The Irish term for a druid was *drai*, modern *draoi* (*dhree*), but its genitive is *druad*, from whence no doubt the Latin *druidis*. The Irish druids were the learned class in early Ireland, as they were in Gaul. They were the lawyers, poets, astronomers, and instructors of youth, and are intimately connected with all early Irish history and fiction.

The invading Milesians had, according to Irish legend, three druids with them in their ships, one of them the poet Amergin. They continue to be frequently mentioned, down to the times of the early Irish Saints. They are met with not only as teachers or tutors, but also as ambassadors and spokesmen. Kings were sometimes druids; so were poets. The word, indeed, seems to have been used with much laxity in early Ireland, and they do not seem there to have formed a definitely established order or caste, still less a regular sacrificial priesthood, as they did upon the Continent; nor does there appear anything to connect them in any way with human sacrifice. In the Latin lives of the Saints the word *druid* is generally translated by *magus*. Some of the early saints appear to have lived on fair terms with them.

When the druid died out *as* a druid is doubtful; the word evidently had an evil sound in the ears of the early Christians, and, while much of the druids' teaching and school organization must have been quietly perpetuated, they themselves either disappeared or else silently adapted themselves to the changes introduced by Christianity. The doctrine of metempsychosis, which was so vigorously insisted upon in Gaul (*cf.* Cæsar *de Bello Gallico*, VI, 14) was perfectly familiar to the early Irish, as saga after saga shows us, though there is nothing to prove that the Irish druids elevated it into a doctrine to be taught in the schools with the deliberate ethical purpose of making men valiant. Again the early books of the Brehon law (and the druids appear to have been the first brehons or judges) contain many curious teachings about the heavenly bodies, the colors of the various winds, and the like, things about which, as Cæsar tells us, the Gaulish druids taught also. There are many other indications that the Gaulish and the Irish druids had much in common, as the chief teachers of their respective nations.

Schools of the Bards and Brehons. — With the gradual abolition of paganism in Ireland the druidic name seems to have died out, and their place to have been taken by the bards and brehons, who were probably their direct, gradually christianized, successors. We know that, side by side with the colleges of the early clergy, there flourished, perhaps in a more informal way, the purely Irish schools of the bards and brehons, but though, thanks to the very numerous lives of early saints, a great deal is known about the Christian colleges, little can be discovered with certainty about the bardic institutions, which represented something much more antique than even the very earliest schools of the Christians. Unlike the Christian schools, however, they do not seem until the end of the sixth century to have been centered in a fixed locality or in a cluster of houses, but to have been peripatetic. The bardic scholars appear to have grouped themselves rather round personalities than localities and to have wandered freely over the entire country, gladly supported by the people. From what must have originally been the druidic school we can see gradually emerging the poet, the brehon, and the historian. At first a poet was by virtue of his office a judge, and there is an interesting account of how through their predilection for technical language which none but themselves could understand they lost this privilege in Conor MacNessan's time, shortly before the Christian era (*Irische Texte*, III, B, 1, pp. 187–204). But we lack exact data to show how and when the historian, the poet, and the brehon differentiated themselves from the more primitive druid. The brehon and historian were frequently united in the same person, for where the lawgiver's judgments concerned, as they so frequently did, the holding of tribal land by virtue of descent, it was almost necessary for him to be a tribal historian as well as a lawgiver; and as much of both tribal genealogy and law was enshrined in verse, he had to know something about this as well. The poets, however, were not necessarily historians or judges. They were a class in themselves, and they were at one time so numerous and so insolent that they constituted an intolerable burden upon the country. Three separate attempts (Keating's *History*, and MacFirbis's *Genealogies*) were made to get rid of them; but each time they found refuge in the northern province of Ulster. At length at the end of the sixth century, a period when, according to the Irish historian Keating (*History*, O'Mahony's translation, p. 446), nearly one third of the free tribes or patrician families had embraced poetry as a pursuit, a determined effort was made by King Aedh MacAinmirech to shake off their incubus. He held a great convention of all Ireland at Druim Ceat, near Limavaddy, in the north of Ireland, to discuss several matters of importance, not the least of which was the banishment of the poets.

It was the intervention of St. Columcille, a poet himself, who saved the bardic institution from extinction or banishment on this occasion. The numbers, however, were cut down to a mere tithe of what they had been. The High King, the kings of the provinces, the chiefs of each territory, and the lords of each subdistrict were all allowed to keep their own Ollamh (*ollav*) or chief poet. None, except those specially sanctioned, were to be allowed to pursue a bardic calling. On the other hand, the order was compensated for this in another way. Their unchartered freedom and licentious wanderings were checked, but they now became for the first time possessors of fixed property and of local stability. Distinct public estates in land were set aside for their maintenance, and they were obliged in return to give public instruction to all comers in the learning of the day. Rathkenry in Meath and Masree in Cavan are particularly mentioned as bardic colleges then founded, where any of the youth of Ireland could acquire a knowledge of history and the sciences. The High King, the provincial kings, and the subkings were all obliged (MacFirbis Ms., *Book of Genealogies*, Preface) by law to set apart a certain portion of land for the poet of the territory to be held by him free of rent, and a law was passed making the persons and property of the poets sacred. At the same time the amount of rewards which they were allowed to receive for their poems was legally settled. From this time forward, for nearly 1000 years, the bardic colleges, as distinct from the ecclesiastical, taught poetry, law, and history, and educated the lawyers, judges, and poets of Ireland.

There were two kinds of poets, the *file* (*filla*) and the bard, the first being the most important. The legal price of his poems was much greater than that of the bard. There were seven grades of *file*, differently named and of different dignity. In his first year the *file* had to learn fifty Ogams, and straight Ogams amongst them. He had to learn the grammar, called *uraicept na n-eigsine*, with its preface, and that part of the book called *reimeanna*, or courses, with twenty *dréachts* (story-lays?), six meters, and other things. The original course of study seems to have been taken in seven grades, but afterwards it lasted for at least twelve years or more (O'Curry *Ms. Materials*, p. 290). Compare with this Cæsar's statement about some of the Druids' pupils continuing their study for twenty years. The highest poet was called an Ollamh (*ollav*) and the annalists give the obituaries of the arch-ollamhs as if they were so many princes. When a poet had at last, after twelve or twenty years of study, worked himself up through all the lower degrees and had attained the rank of an Ollamh, his knowledge, amongst other things, included the following. He knew three hundred and fifty different kinds of versification, he was able to recite and coördinate two hundred and fifty Prime Stories and one hundred Secondary ones. The ancient and fragmentary Mss. (*Irische Texte*, III, Heft 1) in which these details are preserved not only give the names of the meters which the poet had to know, but have actually preserved examples of between two and three hundred of them, taken from different ancient poems, almost all of which have long since perished. Nearly all the textbooks used in the career of the old Irish poet during his twelve years' course are lost, and with them have gone the particulars of one of the most unique and interesting civilizations in Europe. The bards, who were not nearly so important as the *files* were divided into two great classes, the Saor and Daor, or patrician and plebeian bards. There were eight grades in each class, each having a title and honor of his own. Each of these sixteen classes had his own peculiar meters, and the lower bard was not allowed to encroach upon the meters sacred to the bard next in rank. The elaborateness of the system they evolved, the prodigious complexity of the rules, the subtlety and intricacy of their poetical code are astounding, as was also the number of people who followed the profession of poet.

It was not until the Northmen (who first invaded the peaceful shores of Ireland at the close of the eighth century) had laid waste the country and thrown everything into the wildest confusion, that the distinction between the *bard* and the *file* was lost.

The Great Christian Schools. — St. Patrick (died 493?) and the early Christians of the fifth century spent most of their labor upon the conversion of pagans and the building of churches. Columcille (521–597) and the leading churchmen of the sixth century had leisure to give themselves up to the foundation of monastic institutions and the conduct of schools. By the middle of this century Ireland found itself dotted all over with schools, monasteries, colleges, and other foundations belonging to the Christian community, and books had already multiplied to a marvelous extent. The three patron Saints of Ireland, Patrick, Bridget, and Columcille had established their schools at Armagh, Kildare, and Iona. After them St. Edna, whom Dr. Healey (*Ireland's Ancient Schools and Scholars*, p. 164) calls one of the fathers of monastic life in Ireland, settled down finally about the year 483 on the rocky and nearly inaccessible Island of Aron Mór, and he was the first of the holy men who won for it the appellation of Aran of the Saints. Here he was visited by many other celebrated men, among them by Brendan the Voyager, whose wanderings, under the title of *Navigatio Brendani*, became so celebrated later on throughout medieval Europe. To him came St. Finnian, of Clonard, known later as the "Tutor of the Saints of Erin," Finnian of Moville, Ciaran of Clonmacnois, Jarlath of Tuam, and Carthach of Lismore. It is said that even St. Columcille himself in his youth sought Aran to hold converse with him. St. Finnian's school at Clonard, hard by the river Boyne, was founded about the year 520, and even during his own lifetime became a great institution, and three thousand students are said to have gathered round it. It continued to grow in wealth and dignity until the ninth century, but after that time Ireland was in the throes of the Norse invasion, and it was plundered and destroyed twelve times, and burnt down wholly or in part no less than fourteen times. Clonfert on the Shannon was another great college, founded by Brendan the Navigator, and it is said to have produced three thousand monks. Fursa, whose visions were known all over Ireland, Britain, and France, and no doubt (through Bede's *History*) to Dante, was a grand nephew and pupil of Brendan. Even a greater school than Clonfert was that founded by St. Ciaran, the carpenter's son, about the year 544 at Clonmacnois, at a curve in the Shannon near Athlone. This college was resorted to impartially by all the various tribes of Ireland, and the most divergent races both from the North and South gave it assistance and buried their dead in its shade, so that it became the greatest university in Ireland, and produced some of the most distinguished scholars. But, like every other home of Irish civilization, it fell a prey to the barbarians. The Northmen plundered it or burnt it, or both, on ten separate occasions. Bangor on Belfast Lough founded by Comgall, the friend of Columcille, between 550 and 560, was, after Armagh, the greatest school in the northern province, " a noble institution," said St. Bernard (*Life of St Malachy*). Columbanus, who evangelized large portions of Burgundy and Lombardy, St. Gall, the evangelizer of Switzerland, and Dungal, the astronomer, were all disciples of this college. St. Bernard says that the northern pirates slew as many as nine hundred of the inhabitants of Bangor. Other great institutions were Moville at the head of Strangford Lough in the County Down, founded by St. Finnian, who was born some time before A.D. 500, Clonenagh in Queen's County, founded by St. Fintan, Glendalough, founded by St. Kevin, Lismore, the great college of southeast Ireland, founded by St. Carthach, Cork College, founded by St. Finnbar, the school of Ross in Southwest Munster, founded by St. Fachtna, Innisfallen, founded upon an exquisite site on the lower lake of Killarney by St. Finan, and Iniscaltra, on an island in Lough Derg, founded by Columba of Terryglass, who died in 552. In addition to these, a great number of lesser schools existed, and they were crowded with students not only from Ireland, but from foreign lands. Bede tells us of the crowds of Anglo-Saxons who flocked over into Ireland during the plague about the year 664, and how they were all warmly welcomed by the Irish, who took care that they should be provided with food every day without payment on their part, that they should have books to read, and that they should receive gratuitous instruction from Irish masters. Aldhelm, abbot of Malmesbury (a corruption of Mael-dubh's-bury, Maeldubh, its founder, having been an Irishman), tells us that, while the great school at Canterbury was by no means overcrowded, the English swarmed to the Irish schools like bees. The office of St. Cathaldus states that the school of Lismore was visited by Gauls, Angles, Scotti, Teutons, and scholars from other neighboring nations. The same was true of Clonmacnois and other foundations.

The original design of the founders of these schools may have been the propagation of the Christian religion, but it is certain that almost from the very first they taught the heathen classics and the Irish language side by side with scriptural and theological studies. All the knowledge of the time appears to have been taught through the medium of the Irish language, not merely theology but arithmetic, rhetoric, poetry, hagiography, natural science as then understood, grammar, chronology, astronomy, Greek, and even Hebrew. " In Ireland," sums up M. Darmesteter (*English Studies*), " the Classic tradition to all appearances dead in Europe burst into full flower." " The Renaissance began in Ireland seven hundred years before it was known in Italy"; and again " at one time Armagh, the religious capital of Christian Ireland, was the metropolis of civilization." " In the next (sixth) century," says Babington (*Fallacies of Race Theories*, p. 122), the old culture lands had to turn for some little light and teaching to that remote and lately barbarous land (of Ireland)."

The Greek language, all knowledge of which may be said to have died out on the Continent (" had elsewhere absolutely vanished " says M. Damesteter), was widely studied in Ireland. There is a Greek Ms. of the Psalter, written in Sedulius's, own hand (he was Abbot of Kildare about 820), now preserved in Paris; and at least a dozen other Greek texts written by Irish monks are preserved elsewhere in Europe. The knowledge of Greek, says Professor Sandys, in his *History of Classical Scholarship*, " which had almost vanished in the West was so widely dispersed in the schools of Ireland that if any one knew Greek, it was assumed that he must have come from that country."

Irish Teachers on the Continent. — From about 600 to 850 A.D. was the most barbarous and the darkest period of the Middle Ages upon the Continent, a period when all study, both classical and ecclesiastical, was at its very lowest ebb. It was at this period, especially toward its close, that the Irish nation, by general acclamation the most cultured in Europe, sent forth the swarms of scholars to the Continent to teach and preach and found monasteries and preside over schools. About the year 800 Cambrai was a celebrated rallying place of theirs. "Not only Cambrai," says M. Dom Louis Gougaud (*Les Chrétiennes celtiques*, p. 289), "but also Rheims, Soissons, Laon, and Liège, had at one and the same period colonies of Irishmen." At Laon, indeed, thanks to the efforts of the erudite Hibernians, it became for a while the fashion to dabble in Greek. "Bishop Hincmar tried it, and more, he who did not know his own language — according to his uncle Hincmar of Rheims — prided himself upon learning to speak in Irish" (*Hincmar opusculum LV Capitulorum*, quoted by Gougaud). "If," says M. Gougaud, "we consult the evidence given by their contemporaries concerning the learned men that had come amongst them out of Ireland, we must acknowledge that they all show that they are conscious of being greatly in their debt for the progress realized in their studies. Irish knowledge is in their eyes something apart from all else, and worthy of their most pompous encomiums" (p. 293).

But with the evil days of the Vikings came change. The ancient monasteries, shrines, schools, and colleges, and all settled institutions of society offered to the fierce Norsemen the first objects of onslaught, and the shrines of the churches, above all, promised them plunder. For two centuries they made, to quote the words of the almost contemporary Irish historian, "spoil-land and sword-land and conquered land of her, ravaged her chieftainries and her privileged Churches and her sanctuaries, and they rent her shrines and her reliquaries and her books, and demolished her beautiful ornamented temples — in a word, although there were an hundred sharp, ready, cool, and never-rusting brazen tongues in each head and an hundred garrulous loud unceasing voices from each tongue, they could never relate or enumerate all the Gael suffered in common, both men and women, laity and clergy, noble and ignoble, from these valiant wrathful purely-pagan people" (*Wars of the Gael and Gall*, p. 51). One aim of the Norsemen was to destroy all learning. "It was not allowed," writes Keating, "to give instruction in letters . . . No scholars, no clerics, no books, no holy relics were left in Church or monastery, through dread of them. Neither bard nor philosopher nor musician pursued his wonted profession in the land" (Keating's *History*).

On the afternoon of Good Friday, Apr. 13, in the year of our Lord 1014, the dream of a Scandinavian kingdom in Ireland was shattered forever by the crushing defeat of Clontarf, where, however, fell the King of Ireland, his son and heir, and his son's son and heir, leaving the monarchy greatly imperiled and the High-Kingship thrown open, as it were, to competition — to any one who was powerful enough to wrest it to himself. Nevertheless the succeeding century and a half witnessed a great revival of art and learning, of schools and scholarships. The books "drowned" by the Northmen were rewritten in the language of the period, the churches and monasteries rebuilt, the schools repeopled, the bards and brehons reinstated, and some of the old civilized polity brought back. Even before the battle of Clontarf, King Brian had sent emissaries "to buy books beyond the sea and the great ocean," because, says the history, "their writings and their books in every church and in every sanctuary where they were had been burnt and thrown into water by the plunderers" (*Wars of the Gael and Gall*). It is from the brief period of comparative rest succeeding the battle of Clontarf that the most important relics of Celtic literature now in the world date.

The Irish still continued, however, to travel and preach. In 1076 they founded the great monastery of Ratisbon. That of St. James they completed in 1111. They are now to be found as far afield as Bulgaria and Poland. They founded the Monastery of Würzburg in 1134, Nuremberg in 1140, Constanz in 1142, St. George in Vienna, in 1155, Eichstädt in 1183, St. Maria in Vienna in 1200, and scores of others.

The Norman Invasion and Irish Learning. — One hundred and fifty-five years after the battle of Clontarf, that is to say, in May, 1159, appeared the first Norman invaders; and these repeated, though perhaps in a milder form, the havoc and plunder of the Northmen. By the close of the century they had established themselves over Ireland. Then commenced that permanent warfare between the English and the Irish which rendered all literary scholastic and artistic advancement practically impossible. Ireland became, to use a graphic expression of the Four Masters, a "trembling sod." "Since the Norman invasion," wrote the late Miss Stokes, the highest authority upon this subject, "the native character of Ireland has best found expression in her music. No work of purely Celtic Art, whether in illumination of the sacred writings or in gold or bronze or stone was wrought by Irish hands after that century."

The exact position of learning and of education during the four centuries which follow are very obscure. The Normans almost invariably attacked church and monastic property, as being generally the least vigorously defended. They deliberately quenched the holy fire which had burned unceasingly in the shrine of St. Bridget from the fifth century onward,

"The lamp which once shone in Kildare's holy fane
And burnt through long ages of darkness and storm,"

and generally set themselves from the first against native Irish institutions, monasteries, schools, and colleges, both in church and state. They established churches and sanctuaries of their own, and to these institutions no native Irishman was to be admitted. Gradually, however, the bulk of the Normans became largely assimilated with the Irish. They soon gave up talking Norman-French, and spoke and wrote only in Irish. The schools of the bards and brehons which existed throughout the island supplied them, as they did the Gaels, with their family poets, and as most of them adhered to the Brehon law as proper and more suitable to their surroundings than the English, they no doubt were dependent largely upon the Irish schools for their judges and historians also. In most or all of these schools, Latin was spoken as a second language. Every one of any education at all in Ireland spoke it fluently, and through it the Irish, cut off from England by the perennial war between the two nations, kept in the closest touch with the Continent. " They speake Latine like a vulgar language learned in their schooles of Leachcraft and Law whereat they begin children and holde on sixteene or twentie yeares," wrote Campion in 1574. " I have no doubt," writes the Right Hon. Mr. Justice Madden in his book on the *Classical Learning in Ireland* (Dublin, 1908, p. 43), " that the use of Latin as a written and spoken language outside the Pale is a survival from the centuries during which Ireland was the University of Western Europe."

Irish Schools under Elizabeth and her Successors. — Elizabeth's wars did much to break up the power of the native Irish and with them their schools and institutions. Their monasteries had, whenever the English could get at them, been already secularized by her father, Henry VIII, and the collegiate establishments connected with them broken up.

It was the deliberate policy of the English to destroy all the schools and institutions of the native Irish and to kill or banish their learned men, especially the poets. In the Pale, however, and in those parts of Ireland where the English plantation held there were some good grammar schools conducted on English lines which were not interfered with, and some of their best scholars went on to Oxford or Cambridge, generally Oxford. At one time great numbers of native Irish went there, too, but they were soon prohibited by law from availing themselves of this means of education, as Mrs. Green has shown in her *Making of Ireland and its Undoing.* The most ferocious laws of all were passed against the unfortunate poets, and many of them were hanged. James I followed the same policy. Under him the native schools seem to have been ruthlessly closed by Ussher, who became, later on, the Protestant Primate, on the convenient ground that the teachers did not conform to the established religion. Yet some of the bardic schools and of those of the brehons continued surreptitiously to exist, though in ever decreasing numbers and with diminishing prestige, until the first quarter of the seventeenth century. When the Confederate Irish rose to arms in 1642, they strove to reëstablish their native schools, and we find Rory O'More, the close friend of Owen Roe O'Neill, writing to Brussels and urging that the " learned and religious fathers " at Louvain should hasten over to Ireland with their Irish printing presses so as to open an Irish school " before Flan MacEgan dies." This MacEgan was an eminent brehon and head of a celebrated school of law and history in Lower Ormond at the time. The sword of Cromwell, however, put an end to this dream.

The bardic school, to follow the description of them given in the *Memoirs of Clanrickard*, printed in London, 1722, was usually a group of low whitewashed buildings lying in the hollow of a secluded valley or shut in by a thick, sheltering wood, far removed from human traffic and the noise and bustle of the great world. It had few apertures. Each student as he arrived was assigned a windowless room to himself with no other furniture than a couple of chairs, a clothes rail, and a bed. Those students who did not know all about the intricacies of the Irish metrical system, its syllabification, quartans, concord, correspondence, termination, union, laws of nudation, etc., were turned over to the inferior professors. After breakfast the students, having been allotted a theme, returned each to his warm but perfectly dark compartment to throw themselves each upon his bed, to think or compose until supper hour, when a servant came round with candles for each to write down what he had composed. They were then called together into the great hall and handed their written compositions to the professors, and chatted and amused themselves till bedtime. The schools always broke up on the 25th of March, and the holidays lasted for six months. Only members of bardic families as a rule were admitted to the bardic schools, and poetry as a profession ran very largely in special clans, thus tending from the fourteenth to the seventeenth century to become in a way hereditary. The O'Dalys were perhaps the principal poetic family of Ireland, but there were over a score of other families who followed poetry as a profession or from hereditary instinct, as the O'Clearys, O'Coffeys, O'Higgins, Wards, etc.

Elizabeth having extirpated, so far as her power extended, both bards and brehons, and broken up the native Irish schools, set about giving the Anglo-Irish, the planters, and Protestants a university of their own in Dublin. To do this, she founded Trinity College, which has now flourished as a great seat of learning for over three hundred years, supported, however, largely by the lands plundered by the Queen from native Irish institutions. (See DUBLIN UNIVERSITY.) James I and his successor followed this up by founding a number of " Royal Schools," evidently intended as feeders to the new college, — Portora, Enniskillen in 1618, Armagh and Dungannon in 1627, and others. Peter Lombard, the Catholic Archbishop of Armagh, who died in 1625, describes in his *Commentary on the Kingdom of Ireland*, published on the Continent, in Latin, how it had been the steady policy of the English government to cut off all education from the native Irish, even before the difference in religion brought about by the Reformation gave them an additional excuse for doing so. And when the University, so long and so anxiously sought for by the natives, was at last founded *sumptibus indigenarum*, at the expense of the native inhabitants, "most capacious, most splendid," in the shape of Trinity College, Dublin, and they saw themselves excluded from it nominally on religious grounds, their indignation knew no bounds. But indignation availed them little. When they backed it with their swords, Cromwell beat them, and their last state was rendered worse than their former one.

The Restoration and the short-lived rule of James II did not avail very much to reinstate Irish learning or Irish schools. The period was too short and the times too troublous. Then came the defeats at the Boyne and Aughrim and the treaty of Limerick in 1691. After this, all hopes were shattered. The era of the Penal Laws against Catholics commenced, and as almost all the native Irish were Catholics, they were practically deprived of all education. Henceforth, so far as the education of the native Irish, who were the vast bulk of the Irish population, is concerned, it is as an organized thing nonexistent, picked up furtively at home or illegally acquired abroad. Stories are told of children deprived of books learning their letters on their fathers' tombstones. The possession of an Irish Ms. might easily involve the owner in serious trouble or send him to prison. Many valuable books were buried or built up in walls. It was in a wall that the great valuable old Irish Ms., the *Book of Lismore*, was found during the last century. There were no native schools any longer existing except those of the kind later known as Hedge-schools (*q.v.*), where in fine weather the children assembled under the hedges. Still, despite indescribable educational hardships and privations, the classical tradition did not wholly die out. Crofton Croker (*Researches in the South of Ireland*) at the beginning of the last century mentions that "among the peasantry classical learning is not uncommon, and a tattered Ovid or Vergil may be found even in the hands of common labourers." For an account of these hedge-schools in later times, Crofton Croker and Carleton may be consulted. But, to sum up briefly, from the period of the battle of the Boyne down to about the year 1790, when Catholics were at last admitted to matriculate in Trinity College, though allowed none of its honors or emoluments, the words "education" and "Ireland," with regard to schools, colleges, or institutions, have no connection, except in so far as they concern the Anglo-Irish and the Protestant population. D. H.

Modern Period. — *Primary Education.* — The cradle of Irish, and in a sense of English and Scotch, primary education, in the modern acceptance of the term, is to be found in a large school founded in Dublin in 1786. (For this school were built, in 1798, the premises used to this day by the West Dublin Model Schools.) Here was devised a monitorial system, similar to that afterwards connected with the names of Bell and Lancaster, and here took origin the principle of educating the poor without religious interference.

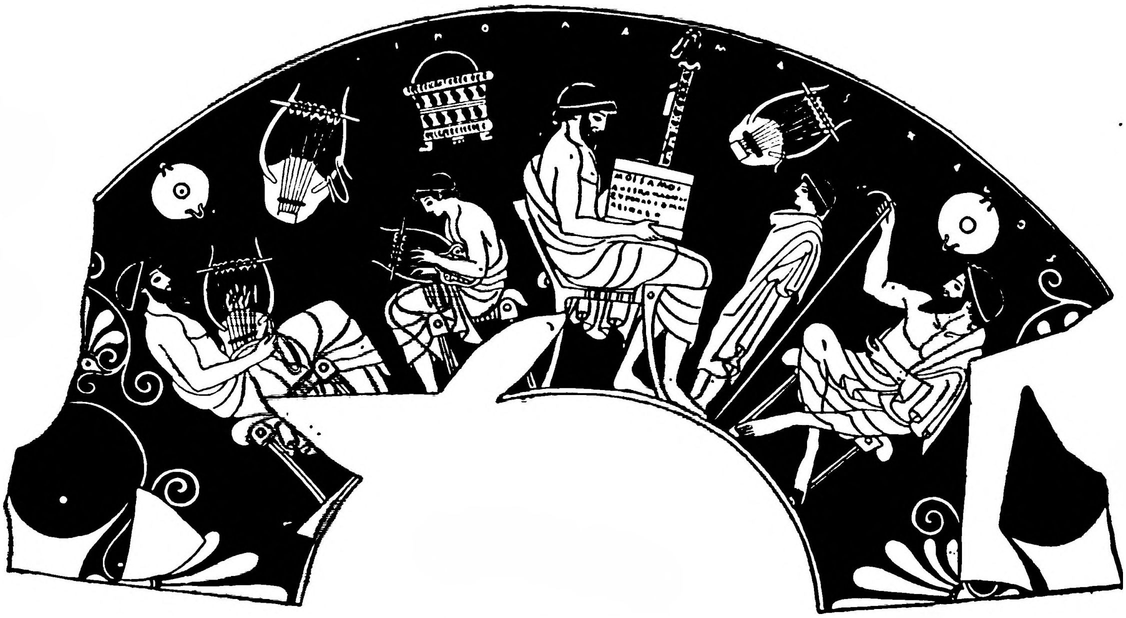
A quarter of a century later, in 1811, the success which had attended the experiment encouraged the formation, on a national scale, of the "Society for the Education of the Poor," better known as the "Kildare Place Society." They proposed to cover Ireland with schools, open to all, and interfering with the religion of none. Their fundamental principle was that the Bible, as common to all sections of Christians, should be read daily, but without note or comment. A commission on education appointed in 1806, in its final report published in 1812, indorsed the principles of the society, and, in 1815, Mr., afterwards Sir Robert, Peel, then Chief Secretary, considered that the recommendations of the commissioners could best be carried into operation by parliamentary grants to the Kildare Place Society. The work of these pioneers, affecting as it has done, in a marked degree, England and Scotland, and to some extent each of the colonies, deserves fuller recognition than it has yet received. Here only the barest outlines are possible. The whole machinery of education had to be called into existence *ab initio*. As has always been the case in Ireland, the demand for knowledge was keen, but the means for satisfying it were crude. It is computed that perhaps five thousand schools of all kinds existed, but so wretched were they commonly that the term "hedge-school" (*q.v.*) was invented to describe them. For the application of the remedy, the society went vigorously to work. At Kildare Place they founded a model school for the training of teachers, which won the admiration of all — (see MODEL SCHOOLS); they published a series of schoolbooks which was largely used not only in Ireland, but in England and Scotland; holding that without a library no school was complete, they issued at cheap rates a collection of works, instructive and entertaining, which had no rival at the time, and in consequence went all over the world; with the help of the sums voted by Parliament, which rose to upwards of £30,000 a year, building grants were made to encourage and supplement the exertions of the localities, with the result that substantial schoolhouses, built commonly in accordance with plans furnished by the society, sprang up everywhere. Finally, a careful system of inspection was planned, the prototype, in many of its features, of every subsequent system, and a staff of inspectors trained for the purpose visited the schools all over Ireland.

The success which rewarded the society was signal: 150 masters and 60 mistresses left the Training School each year; the annual output of the "Cheap Publications" was 60,000; the society's schools, which numbered 8 in 1816, had risen to 1621 in 1831; pupils to the number of 137,639 were in attendance, the average per school being between 84 and 85. It is not surprising that, with such a record in view, distinguished visitors from other countries, expressed their admiration and approval in the strongest terms. Professor Pillans (*q.v.*), prominent for his work on behalf of Scotch education, was of opinion that the Kildare Place Schools were a hundred years ahead of those in Scotland. The Count de Lasteyrie, in a letter still extant, pronounced the model school the best in the world.

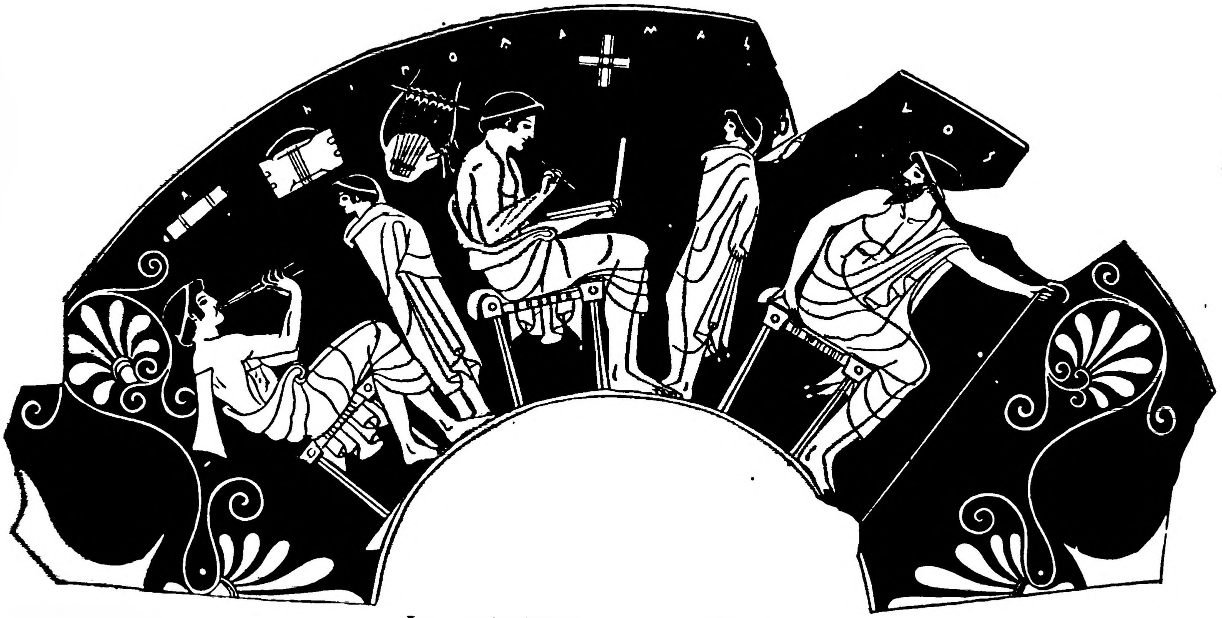
In 1831 the Kildare Place Society was succeeded by the National Board. The fall was the result of the strictness with which they enforced the rule which enjoined the reading of the Bible without note or comment. The rule was never popular; churchmen objected to the prohibition of definite catechetical teaching; Roman Catholics received with suspicion anything of the nature of joint religious instruction; in 1827 the Commission of Educational Inquiry reported against the rule, and in 1829 a select committee of the House of Commons recommended that Irish primary education should be intrusted to a board responsible to Parliament, whose principle should be combined literary and separate religious instruction. The National Board, whose constitution was framed in accordance with this recommendation, met with violent and protracted opposition. The Presbyterians were the first to move; quite satisfied themselves with the Kildare Place Society, they resented what they considered a slight to the Bible, and in particular they found fault with certain regulations for promoting combined instruction, which would force them into joint action with Roman Catholics. Churchmen were not long in following. The absence of distinctive teaching had seemed to them a blemish in the Kildare Place Society; the Society, however, had insisted on the reading of the Bible, but the National Board not only made no such demand, but was even disposed to exclude from "school hours" any time which might be devoted to its study. The result was an educational schism which lasted more than fifty years, and at times threatened the very existence of the Board. For the prosecution of the attack the Church Education Society was founded in 1839. By adding definite denominational teaching to the Bible reading of the Kildare Place Society, a new warmth of interest was evoked, and the income from voluntary sources rose as high as £45,000, — more than Kildare Place had enjoyed at the height of its prosperity. So numerous were their schools that, as late as the date of the Powis Commission in 1870, they were held to constitute a dangerous menace to the Board. The last to oppose were the Roman Catholics; satisfaction at the overthrow of Kildare Place made them disposed to welcome the National Board; for a time even the Christian Brothers placed their schools in connection. Roman Catholics, however, were not more favorable towards combined instruction than the other opponents, and when the Board early changed "combined literary" into "combined moral and literary" by introducing for all a book of *Scripture Extracts*, their suspicions were aroused, and they lost no opportunity of giving publicity to their objections; in particular, the Synod of Thurles in 1852 openly denounced the system of the Board.

As the result of these attacks, many modifications were introduced into the original constitution. Two call for mention here. (1) Non-vested Schools, as distinct from Schools Vested in the Board, were permitted, — a concession by which the principle of combined instruction was virtually abandoned, because, in a non-vested school, religious instruction cannot be given, as of right, except by the denomination with which it is connected. (2) A compulsory conscience clause was introduced whereby the teacher must send away during religious instruction pupils of differing beliefs. In consequence of these and other concessions, the Board, which began with an undenominationalism more marked than that of Kildare Place, became transformed into a denominational system with a conscience clause, and as such it has completely solved the religious problem in connection with primary education in Ireland.

The education given in national schools began on Kildare Place lines, and the books of the society were largely used. Gradually the Board prepared books of their own, and until lately no others were permitted. The teachers were paid by local contributions, by school fees, and by fixed salaries depending on their classification. In 1870 a modified system of payment by results was superadded. It had the usual effect of emphasizing the subjects or portions of subjects which brought fees, to the detriment of the rest. In 1900 the resulting system was abandoned, and a new method of paying the teachers was introduced. At this date the amounts contributed by the localities were insignificant, and school fees had been abolished by the act of 1892. For purposes of salary, three grades were introduced. Teachers, who formerly rose by examination, are now promoted from the lowest to the highest grade by seniority and merit; they are also awarded triennial increments for good service, and receive a pension which is arranged on a contributory basis, on retirement. The average incomes from state sources are as follows: —



Lessons on the Lyre and in Homer.



Lessons in Writing and Flute Playing.

A Greek Music School.
From a Kulix by Douris (c. 450 B.C.).

Principals		Assistants	
Men	*Women*	*Men*	*Women*
£112	£90	£81	£68

In addition to the more ordinary branches, the curriculum includes singing, drawing, object lessons, physical drill, hand and eye training including kindergarten, elementary science, cookery, and laundry. Instruction in these subjects has been much developed since 1900, and the same is true of Irish, which is now taught in 3066 schools to 180,000 children, as compared with 105 schools and 1825 children in 1899. On the 31st of December, 1909, there were 8401 schools in operation in connection with the National Board. In the following table the progress of primary education is shown from the Census Reports:—

	Proportion Per Cent				
	1861	1871	1881	1891	1901
Read and Write .	41	49	59	71	79
Read only	20	17	16	11	7
Neither Read nor Write	39	33	25	18	14

Higher Grade Schools. — The board, owing to the inadequacy of the grants, has hitherto been unable to make satisfactory provision for the higher education of promising pupils. For the Roman Catholics, the Christian Brothers have done much to remedy this deficiency; for the Church of Ireland the scholarships of the Incorporated Society have discharged a similar office.

The Training of Teachers. — As was seen above, the training of teachers in Ireland had attained to European celebrity under the Kildare Place Society. The National Board founded its college in Marlborough Street in 1833. Till 1883 it remained the only government college; being undenominational, it met with little support from churchmen or Roman Catholics. In 1883 the English system of denominational colleges was extended to Ireland, and specially favorable terms were granted in 1890 in order to place the new college on a level with Marlborough Street. There are now seven colleges, one of them being the old foundation of the Kildare Place Society, which, as the Church of Ireland Training College, became a government denominational college in 1884.

Secondary or Intermediate Education. — The position of secondary, or, as it is generally termed, Intermediate, Education, during the century previous to the Commission of 1885, may be estimated by means of a passage from the commissioner's *Third Report.* After drawing attention to the inadequacy of existing endowments, they say " the subsequent course of our enquiries has confirmed our belief that the provision for intermediate education in Ireland is wholly inadequate, and bears no just proportion to the provision for university and primary education." Unsatisfactory as the results were found to be where the resources were so slender, the common mismanagement of the endowments made matters still worse. In striving to account for the failure of the Royal Schools, whose endowments were the largest in Ireland, the commissioners were of opinion that a prime cause was to be found in the constitution of the supreme authority. In 1813, as the result of the Commission of 1788, the royal and other endowed schools, were placed under a newly formed board, entitled the Commissioners of Education in Ireland. The constitution of the board was such that the commissioners were not brought into contact with the schools, nor had they direct interest in or control over them. But whatever the contributory causes may have been, the deficiencies of the intermediate schools as a whole were marked. During the last twenty-five years, however, a decided change has taken place, the credit for which is largely due to the Educational Endowments Commission, 1885–1894, and to the Intermediate Education Board. The Royal Commissions reorganized the Commissioners of Education, and perfected schemes for the management of upwards of 200 endowments. In all they did they emphasized the importance of giving the localities a definite share in the control of the schools, and made provision for dealing with neglect or inefficiency. The Intermediate Board represents an attempt of government to subsidize secondary education. Founded in 1878, and endowed with £1,000,000 out of the Irish Church Surplus, its funds were increased by the local taxation (customs and excise) act of 1890, — a variable source of income against whose fluctuations they have recently been guaranteed by fixed sums included in the estimates. As originally constituted, the sole duty of the board was to hold examinations in centers all over Ireland, and to distribute its funds upon the results, the schools receiving fees for each pupil who passed, and the pupils being rewarded with exhibitions and prizes. In 1900, in accordance with the recommendations of a royal commission, this cast-iron system was modified, and extended powers were granted; in particular, provision was made (*a*) for introducing inspection, (*b*) for arranging with the newly formed Department of Agriculture for practical examinations in science, and (*c*) for the encouragement of specialization. While few defend the methods of examination, and the payment on individual results which are indorsed by the acts under which the board works, and while none can excuse the sluggishness with which the required funds are supplied by Parliament, there can be no question as to the quickening power which the board has exercised. As an illustration, it may be mentioned that though inspection was approved in 1900, the appointment of inspectors had to be delayed till 1909 through lack of the necessary funds. The intermediate schools of Ireland fall under three main divisions: the old endowed schools which, for the most part, are in Protestant hands; schools founded and managed by the different Roman Catholic orders; and schools which are the result of private enterprise. In 1850 the income of fifty-four of the largest endowed schools was under £15,000, and in ninety towns with population of 2000 and upwards, there was no provision of any kind for secondary teaching. Since the establishment of the Intermediate Board, a sum which has averaged £50,000 has been distributed annually among the schools, in addition to the prizes and exhibitions whereby deserving pupils have been helped. How the work has grown, the following table will show: —

NUMBER OF STUDENTS WHO PRESENTED THEMSELVES FOR EXAMINATION

	Boys	Girls	Total
1879 . . .	2163	521	2684
1899 . . .	5726	2042	7768
1910 . . .	7967	3933	11900

The examinations in 1910 were held at 988 centers, in 127 different localities.

Technical and Commercial Education. — As early as 1841 the demand for education with a definite practical end took shape in the establishment of an engineering school in connection with Trinity College, Dublin, — a step in which the Irish university gave the lead to both Oxford and Cambridge. In 1867 the Royal College of Science was founded with the specific object of giving instruction in science as applied to the industrial arts, especially mining, engineering, and agriculture. In 1900 a step of much importance and fruitful in results was taken in the establishment of the department of agriculture and of technical instruction. With the help of parliamentary grants of upwards of £180,000 annually the department has been able to make progress in many directions, and has taken a prominent part in the industrial revival of the twentieth century. In many parts of Ireland special industries have been promoted and helped; much attention has been bestowed upon the improvment of live stock; and, in particular, admirable work has been done in connection with agriculture. The aim has been to place within general reach good technical knowledge of all subjects relating to agriculture. Local schools have been set up, and classes conducted in the most remote districts; itinerant instructors and field demonstrators have gone everywhere. With such kindred institutions as the Albert Agricultural College, Glasnevin, and the Munster Institute, the department has willingly coöperated, it has made full use of the machinery of the county councils, and has employed the College of Science in many practical ways. The college is now under the management of the department, and its splendid new buildings opened in July, 1911, are rich with promise. Specially worthy of notice is the educational work done in promoting practical instruction in experimental science, drawing, manual work, and domestic economy in secondary schools. Unlike the Intermediate Board, the department enjoys freedom of action, and has been able to plan its educational activities upon modern lines, with the most satisfactory results.

Higher Education. — Trinity College, Dublin (see DUBLIN UNIVERSITY), and Maynooth were the universities of Ireland in 1800. Since 1794 Trinity had received students of all creeds, but Roman Catholics were debarred from its fellowships and scholarships. Maynooth had been founded by the Irish Parliament in 1795, with an endowment of £8000 a year, to prepare students for the Irish priesthood. From 1800 onwards the university question has passed through many phases, in all of which two sets of influences have been at work. The Roman Catholics, with fixed purpose, have been struggling to obtain for themselves a university which would combine unquestioned efficiency and due recognition of ecclesiastical authority. Trinity College, eager for the maintenance of its supremacy and independence, has either sought or accepted reform after reform, thereby demonstrating its liberality and enhancing its influence.

The steps taken toward satisfying the requirements of the Roman Catholics have been many. At the Union the endowment of Maynooth was continued. In 1813 it was raised to £8928. In 1815 the Maynooth Act gave a permanent subsidy of £26,000 a year, which was commuted in 1869 for a capital sum of £372,000 out of the Irish Church Surplus. Sir Robert Peel, who had shown a similar spirit in his recognition of the Kildare Place Society, was the first to take definite steps to meet the desire for a university which would be available for and acceptable to all. His plan was to found a group of federated nonsectarian colleges, affiliated for examinations and degrees with a central university. The Queen's Colleges, as they were called, were established and endowed in 1849 in Belfast, Cork, and Galway; they were given faculties in law, medicine, arts, and engineering. The establishment of the Queen's University in 1850 completed the scheme. From the first, anything of the nature of permanent success was hopeless. Before the plan was tried, its wholly secular character incurred the con-domination of the Pope, and in the year of its foundation the university was denounced by the Synod of Thurles. Furthermore, the same year saw the Roman Catholics preparing to open a university for themselves. The result was the Catholic University of Dublin, which was founded in 1854, with Doctor, afterwards Cardinal, Newman, as its first rector. Perhaps the chief purpose served by this university was to emphasize the demand of the Roman Catholics for equality of treatment with reference to higher education. Refused a charter by the government, and therefore unable to grant degrees, depending wholly on private support, and for this reason compelled to work in a restricted area, the university could never satisfy the requirements. Very effectually, however, it drew the attention of statesmen alike to the earnestness and the determination of the Roman Catholic party, both clerical and lay, with the result that, for the rest of the century, and up to 1908, the question of a Catholic university was always prominent. After several previous attempts by other statesmen, Mr. Gladstone (*q.v.*) introduced his bill in 1873. His plan was to have one great university, which would include different colleges, such as Trinity College, the Catholic University, and any other properly qualified. The project met with little favor, as provision was not made for endowing the Catholic College, the Roman Catholics were only lukewarm in their support; Trinity College, considering that anything which interfered with independence must be injurious, offered the most strenuous resistance. The bill was thrown out, and the ministry fell. Lord Beaconsfield was more successful when, in 1879, he abolished the Queen's University, and replaced it by the Royal University of Ireland. With the exception of its medical faculties, which required courses of lectures at certain recognized institutions, the new university was wholly an examining body which had power to bestow prizes, and confer degrees, on all who presented themselves, irrespective of their colleges. This alone was sufficient to include Roman Catholic colleges in university benefits, and the Catholic University of Dublin enjoyed some special advantages through being able to appoint on its staff fellows belonging to and paid by the Royal University. The effect was seen immediately in the reorganizing of the Catholic University. As a set-off to the Queen's Colleges, which would be credited as a whole with the distinctions of their students, six Roman Catholic colleges, viz. Maynooth, the Catholic University of Dublin, henceforth known as University College, University College, Blackrook, St. Patrick's College, Carlow, Holy Cross College, Clonliffe, and the Catholic University School of Medicine, were federated to form the Catholic University. The Royal University met with some favor, on account of its recognition of the Roman Catholic colleges; there was, however, a feeling that the students of these colleges were at a disadvantage, as compared with those from the state endowed and equipped Queen's colleges, and it was strongly held that the whole scheme kept the Roman Catholic colleges in "tangible and humiliating inferiority to Trinity College, Dublin." In consequence, the agitation for equality of treatment continued. An attempt made by Mr. Bryce in 1906 failed, as Mr. Gladstone had failed, because it proposed to interfere with the privileged independence of Trinity College. It remained for Mr. Birrell to find what may perhaps prove a satisfactory solution of the difficulties in his Act of 1908. By this act two new universities were founded and endowed, viz. the National University, and Queens' University, Belfast. The Royal University was dissolved, and University College, Dublin, Queen's College, Cork, and Queen's College, Galway, became constituent colleges of the new National University. Though the National University is undenominational, and free from tests, in awarding its honors and making its appointments, it encourages the teaching of religion, provided the expenses are not paid out of state funds, and its governing body is so constituted as to command the confidence of Roman Catholics. By way of endowment the National University received £170,000 for such expenses as buildings and equipment, together with an annual grant of £64,000. Queen's University, Belfast, received for building and equipment £60,000, with an annual grant of £18,000.

The Presbyterian Church has two colleges empowered to grant degrees in divinity, one in Belfast, the other in Londonderry.

The higher education of women has been promoted in particular by Alexander College, Dublin, the Queen's Institute, and the Ladies' College, Belfast. The Royal University stimulated the movement by being the first university in the United Kingdom to open its degrees to women.

H. K. M.

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IRELAND, NATIONAL UNIVERSITY OF. — See Ireland, Education in.

IRENÆUS (*c.* 130–202). — Church Father, a pupil of Polycarp, who in his turn was a disciple of St. John, and is therefore a most important witness as to the life and faith of the Christian Church in the first two centuries of its history. In early life he removed from Asia Minor to Rome, where he became influential as a teacher. In 177 he was made Bishop of Lyons, and for the next twenty-five years figured prominently as a peacemaker in the controversies of that period. He took great pains to ascertain and transmit the apostolic tradition as to Christian doctrine and practice, and did good service in establishing the unity of the Old and New Testaments. He was the first writer to treat the Bible as an inspired whole, and took a prominent part in the formation of the New Testament Canon. His chief significance as a theologian consists in his doctrine concerning the Person and Work of Christ. He was the first doctor of the Church who worked out with any thoroughness the great doctrines of the incarnation and redemption, and his treatment of these subjects was by far the deepest and soundest which they received in the ante-Nicene age. His method was to oppose a true Christian gnosis to the heretical gnosis which disturbed the early church. It was by this conflict with Gnosticism (*q.v.*) that Christian theology was developed and vitalized, and Irenæus was its earliest champion. His acute and striking polemic subserved the interests of philosophy as well as those of religion. He was a writer of painstaking accuracy, and his writings are of the highest value as sources of ecclesiastical history. None of them have survived in the original Greek, but there are very ancient Latin versions of two of them. His *Refutation of Knowledge Falsely so Called*, commonly known as *Adversus Hæreses*, in five books, is our chief source of information as to gnosticism (*q.v.*) and other heresies. It is one of the most precious remains of early Christian literature and is an inexhaustible storehouse of apologetic materials. His *Proof of Apostolic Teaching*, a later work, is of a more positive character and was written, not to confute heretics, but to confirm the faithful by a defense and exposition of the Christian Faith. W. R.

See Christian Church, Education in the Early; Gnosticism; Scholasticism.

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Smith and Wace, *Dictionary of Christian Biography*, an exhaustive article on Irenæus by Lipsius.

IRNERIUS (*c.* 1050–1130). — Italian jurist, probably born at Bologna. He was a master of liberal arts and taught rhetoric at Bologna while still comparatively young. Extravagant claims have been made for him as the founder of the study of law at Bologna, and the introducer of glosses. That he was neither has been shown by Rashdall, but his importance in the development of legal study cannot be denied. Previous to the time of Irnerius, the chief center for the study of law was Ravenna. Several circumstances combined to bring about the decline of Ravenna and put Bolgna in the position of importance. Irnerius undoubtedly contributed to this by introducing and lecturing on the new parts of the Digest, hitherto unknown in Bologna, as well as the old; and he was possibly the first glossator of it; the old philosophic study of legal principles was replaced by a closer and more professional study of texts; at this time the whole *Corpus Juris Civilis* began to form the curriculum for students of civil law; the specialization now demanded led to a law faculty as distinguished from liberal arts, and law became a professional study with more mature students. These facts tended to give the law students and law doctors a position of great influence not only in Bologna, but throughout Italy, and to this influence Rashdall traces the rise of the student-university characteristics of Bologna.

Irnerius was the author of a legal formulary (*formularium tabellionum;* see DICTAMEN), and of many other works, the chief being the *Summa Codicis*, the earliest medieval system of jurisprudence. He held an important position as an imperial jurist, and his name appears frequently in royal documents from 1113 to 1125. On the question of papal election he supported the claims of the Emperor Henry V.

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IRRADIATION. — Whenever a portion of the retina is stimulated by a beam of light, there is a tendency for the stimulation to spread over neighboring portions of the retina. The result is a sensation which is not limited to the direct source of the stimulation. Illusions sometimes arise from the spreading of the stimulation. Like phenomena of spreading of irritation have been observed in other parts of the nervous system.

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IRRATIONAL NUMBERS. — A number that cannot be expressed as the ratio of two integers is called an irrational number. It is not necessary that such a number should be expressible as a terminating decimal. For example, $\frac{7}{9} = 0.777\ldots$, and $\sqrt{2} = 1.4142\ldots$, but the former is rational while the latter is irrational. There are irrational numbers that cannot be expressed in such a surd form as $\sqrt{2}$, as, for example, π and e. (See TRANSCENDENTAL NUMBERS.) The modern theory of irrational numbers is due largely to Weierstrass, Dedekind, and G. Cantor. For this theory the reader may consult Dedekind's *Essays on Number* (translated by Beman), Chicago, 1901. The theory is not simple enough for the secondary school, so that there the work must be confined to the recognition of the common laws of operation with these numbers. The tendency at present is to eliminate from the secondary school all work with irrationals of a complicated nature, reserving this until the theory can be studied more fully in college. In particular, the extracting of the square root of a binomial surd, a subject of practical value before the invention of the decimal fraction, is now commonly omitted in this type of school, at least beyond the most elementary case. D. E. S.

See also ROOTS; INCOMMENSURABLE QUANTITIES.

IRRITABILITY. — The disposition of organic substance to undergo certain marked physiological changes under the influence of incident forces which act as stimuli. All living substance is irritable in that it is capable of reacting, in some way, to stimuli. The term is primarily a physiological one, and it has no psychological implications. In other words, irritability may, for all that is known, exist in the absence of sensibility. Nerve and muscle cells are commonly said to be highly irritable because upon the application of certain forms of energy they undergo pronounced changes. The nerve cell, when acted upon, may give rise to a nervous impulse; the muscle cell may entirely change its form. These two kinds of cells are first thought of as possessing irritability, because their expressions of this property are more striking than those of most types of cell. R. M. Y.

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ISELIN, ISAAK (1728–1782). — Swiss author and philanthropist. Born at Basel, he studied law at Göttingen, and after traveling for some years obtained an appointment at Basel as Secretary to the Council. He devoted himself almost immediately to public and political questions. His chief philosophical works were *Geschichte der Menschheit* (*History of Mankind*, 1764), and *Traüme eines Menschenfreundes* (*Dreams of a Philanthropist*, 1776), in which from a viewpoint opposed to that of Rousseau the progress of man is the upward progress of reason to happiness and perfection. Iselin's main interests, however, seem, as with so many other Swiss leaders at this period, to have lain in education for the improvement of the nation and humanity. In 1760 he played an important part in organizing the *Helvetische Gesellschaft*, and in 1777 the *Gesellschaft der Guten und Gemeinnützigen* (Society for the Public Welfare), which has continued to the present.

In 1760 he was appointed on a commission to consider measures for the improvement of the Basel gymnasium. He had already offered suggestions in 1757 for the improvement of the university in *Unvorgreiflichen Gedanken über die Verbesserung des Baselschen hohen Schulen* (*Humble Thoughts on the Improvement of the Basel] High Schools.*) In 1768 he wrote a collection of stories for children (*Sammlung den Nutzen und Vergnügen der Jugend gewidmet*). In the same year appeared *Über Erziehung* (*On Education*), in which there is a demand for an education to train men to the highest, noblest, and best, not through abstract ideas, but by pleasurable, interesting, and concrete methods. Such work was for the philosopher who thoroughly understands children. At this time Basedow's *Vorstellungen* came into his hands, and thenceforth Basedow had no warmer friend and supporter. Iselin secured subscriptions, brought the *Appeal* to the notice of the *Helvetische Gesellschaft*, and hoped that such a school would be established in Switzerland. In *Über die Erziehungsanstalten* (*On Educational Institutions*) the author makes a proposal for institutions in which different classes of society could be educated for life's work side by side for their mutual welfare. The education of girls is also insisted upon. Above all, Iselin seems to have welcomed the possibility of training teachers opened up by Basedow, and he assisted four Swiss students to proceed to Dessau for training. He continually kept the merits of the Philanthropinum and the movement connected with it before the public in *Ephemeriden der Menschheit oder Bibliothek der Sittenlehre und der Politik* (1776–1782).

How great was Iselin's service to Pestalozzi, it is impossible to estimate. After meeting with repeated failure in his attempt to secure the publication of *Leonard and Gertrude*, Pestalozzi turned to Iselin, who read through and corrected the Ms., secured a publisher in Berlin, and arranged for a reasonable remuneration for the work.

The *Gesellschaft der Guten und Gemeinnützigen*, of which Iselin was the moving spirit, devoted a great part of its labors to education; it offered prizes for attendance and drawing; distributed readers; taught special subjects such as singing, geometry, and needlework; encouraged gymnastics and opened a girls' school in 1812; founded libraries for children and adults, museums, a civic newspaper; conducted children's festivals; and apprenticed boys on leaving school.

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ISIDORE OF SEVILLE, or ISIDORUS HISPALENSIS.— A Spanish bishop who flourished in the late sixth and early seventh century. He was noted for his learning, eloquence, and ability, and was the author of numerous treatises. His importance educationally, however, depends upon his one work, the *Etymologiarum Libri XX* or *Origines*. This was an encyclopedic work covering all branches of knowledge which served throughout the Middle Ages as a textbook of higher learning and a source of general information. For his sources the author depended quite generally upon second-hand information, and was not very particular as to its character. Yet it was convenient and an authoritative church summary and as such exerted wide influence. The titles to the various books are as follows: (1) Grammar; (2) Rhetoric and Dialectic; (3) Arithmetic, Geometry, Music, and Astronomy; (4) Medicine; (5) Law and Chronology (history); (6) Ecclesiastical books and offices; (7) God, angels, and the orders of the faithful; (8) Church and the sect; (9) language); (10) Society and relationship; (11) Man and habits; (12) Animals; (13) The world and its parts; (14) The earth and its parts; (15) Buildings, fields, and their measures; (16) Stones and metals; (17) Agriculture; (18) War and games; (19) Ships, buildings, and garments; (20) Provisions, domestic and rustic instruments. F. W.

See ENCYCLOPEDIAS; LIBERAL ARTS, SEVEN; MIDDLE AGES, EDUCATION IN.

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ISOCRATES (436–338 B.C.). — The Athenian orator and rhetorician played an important part in the educational history of the fourth century. Educated under the leading sophists, Prodicus, Protagoras, and Gorgias, he became a professional logographer or advocate, *i.e.* he wrote speeches for clients engaged in lawsuits. About 390 B.C. he opened a rhetoric school at his home near the Lukeion. In his speech, *Against the Sophists*, written *c.* 390 B.C., he attacks those who attract pupils by low fees and big promises of imparting absolute and universal knowledge and eloquence without regard to the natural ability of the pupil. He aimed to prepare for an active public life, and this preparation consisted in a study of philosophy or a training in the formation of correct judgments by practice in deliberation and debating. He took pupils from the ages of about fifteen to twenty-one and charged ten minæ (about $200) for the course of three or four years. Students from all parts of the

Greek-speaking world flocked to him. He expected a previous knowledge of mathematics and sciences, and his own course consisted of essay writing and speeches on all manner of topics, practical, political, theological. Emphasis was laid on style, diction, and matter. Speeches written by himself or others, including those of pupils, were studied, and subjected to criticism and revision. By a wise selection of themes and by inculcating high standards, Isocrates claimed that his course in itself was an excellent training of character, for he did not hold that virtue was teachable. The success of his school was evidenced not only by his own great wealth, but by the number of his students who attained eminence in all walks of life, as rulers, statesmen, orators, lawyers, and historians. The truly educated man is distinguished by good taste, sound judgment, correct behavior, self-control, and modesty. Culture and polish were the ends of education, for, as he says, "Those whose soul is well trained to play its part in all these ways, those I call wise and perfect men, and declare to possess all the virtues; those I regard as truly educated." This ideal in almost identical terms is, of course, also characteristic of the Renaissance. Towards the close of his career (354 B.C.) his great wealth drew on him an attack from one of his many rivals whom he had so often criticized. In his defense, *Antidosis*, or *On the Exchange of Estates*, he sums up his career as a teacher and defends himself and rhetorical training. For the use of selected *Orations* of Isocrates in modern schools, see GREEK, STUDY OF.

See RHETORIC, HISTORY OF THE TEACHING OF; RHETORIC SCHOOLS.

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ISOLATION. — A term used to express the opposite of correlation (*q.v.*), in instruction, or the method of teaching subjects as separated from one another. It is claimed that only by recognizing arithmetic, geography, history, etc., as independent studies, adequate and complete in themselves, can each subject attain its own due rights and realize its own appropriate end. The logical idea underlying this contention is that the various subjects represent something beside convenient distinctions carved out within a comprehensive unity; it assumes that there are just so many objectively important phases of reality, and that each subject (or group of subjects) stands for just one of these phases. Accordingly by isolation of each subject and then by coördination of the various independent subjects, the subject matter of instruction will be rendered both definite and harmoniously complete.

It may be replied that, philosophically speaking, both isolation and correlation represent stages in growth from the more direct and vital forms of experience to its logical formulation; that is, its organization for purposes of better intellectual control. Experience does not begin with a number of sharply marked off fields, or topics, either requiring to be made more distinct and definite in their separations, or else needing to be bound up together by various correlating devices. It begins with a vague, somewhat confused and fluctuating unity, whose parts flow readily into one another, these parts being marked off by various interests and purposes, rather than by objective or logical differences. Growth takes place by a movement toward differentiation, on one hand, and toward interrelation of discriminated parts on the other. Isolation thus represents a goal toward which instruction and learning are moving, not original divisions. The distinctive character of mathematics, as a subject on its own account having its own unique material and special method, follows after a term of study marking the attainment of a logical comprehension. Even then it is undesirable that differentiation should be carried to the point of isolation in its literal sense. For the purposes of all education save that of the specialist it is needful that the interdependence of each study with the other studies — their mutual applications to one another and to life — should be borne in mind. This requirement is met only when correlation and differentiation are used to supplement each other, instead of being treated as rivals. J. D.

See CORRELATION.

ISRAELITES. — See JEWISH EDUCATION.

ITALIAN, STUDY OF. — See MODERN LANGUAGES.

ITALY, EDUCATION IN. — Italy is a parliamentary monarchy. Its area is 286,682 square kilometers, its population 34,688,653 (1911). The territory is divided into 69 *province* and over 8000 *comuni* (towns and villages). The affairs of a province are administered by a *Consiglio provinciale* (provincial council), elected by the people, and a *Deputazione provinciale* elected by the *Consiglio* from among its members. The affairs of a *comune* are likewise administered by a *Consiglio comunale*, elected by the people, a *Sindaco* (mayor), and a *Giunta comunale* (communal committee), elected by the *Consiglio* from among its members. A government officer, the *Prefetto*, supervises all local bodies. Provinces are for administrative purposes subdivided into *circondari* (circuits) or *distretti* (districts). The town in which the *Prefetto* resides and the *Consiglio provinciale* meets is called *Capoluogo di provincia*, and gives the name, as a rule, to the province. Likewise, the administrative center of a *circondario*, or *distretto*, is called *Capoluogo* (chief town) *di circondario*, or *distretto*.

HISTORICAL DEVELOPMENT. — Italian education, as a part of Italian culture, is a direct outgrowth of Roman society and has its origin even in pre-Roman times. The consideration of these historical foundations of modern conditions is given under Roman Education. The Roman schools continued until well into the Middle Ages, and the discussions of education during the Middle Ages (*q.v.*) applies particularly to Italy. So, too, the discussion of Monasticism and Education and the minor topics such as Abbey Schools, Bishops' Schools, etc., relate particularly to Italy. Universities took their rise in Italy, and the discussion of origins under this topic has special reference to Italy. Again, with the period of the Renaissance, the educational and cultural influences had their origin in Italy, and the survey of education during the Renaissance (*q.v.*) forms but a chapter in the history of Italian education. The Teaching Orders (see JESUITS, etc.) furnished many schools after the Reformation. After the Council of Trent (1545) seminaries were established in many places, and, though primarily intended for the training of the clergy, laymen were also often instructed in them. The academies and private schools of both secondary and elementary type furnished a well-developed system of schools for Italy during the early centuries of the modern period. These were established by princes, by teachers, by cities, or by private endowment, or by ecclesiastical authority of various types. Some of these schools were very noted. In some instances there was an approach to a local system of schools. Venice, for instance, had public schools very early; and in 1551 it was ordered that each section of the city should maintain a grammar school. However numerous, these schools cannot be regarded as constituting a system of education, though provisions were made by some of the states to regulate the whole matter. One of the earliest is perhaps that of Victor Amedeus II, of Sardinia (1729). Education in the first half of the eighteenth century fell to a very low plane; in the second half there is the beginning of a revival. In Lombardy, then under the Austrian crown, were introduced the reforms of Maria Theresa and her successors. (See AUSTRIA.) After the invasion of the French at the end of the eighteenth century and at the beginning of the nineteenth, Italy passed under the rule of France, either directly, as Piedmont, Genoa, Rome; or indirectly, as the kingdoms of Naples and Italy, and laws were enacted following the French model. The fall of Napoleon brought back the old régime, and very little, if anything, was done to promote public education, though universities and many schools were state or municipal institutions more or less controlled by the clergy. The kingdom of Sardinia had a general statute pertaining to education (1824); Lombardy and Venetia, under Austria, followed Austrian laws; other states had no general statutes.

THE PRESENT SYSTEM OF EDUCATION. — The fundamental law that regulates public instruction in Italy is the Casati act of Nov. 13, 1859. When promulgated, it applied only to the kingdom of Sardinia; that is, Sardinia, Piedmont, Liguria, and Savoy, and Lombardy; it has since been extended, with some changes, to other parts of the kingdom of Italy. The lack of another general act, however, has caused many parts of it to be applied more or less legally to the whole kingdom, and it has been the basis of most of the acts dealing with particular phases of education.

Central Administration. — At the head of the national system is the Minister of Public Instruction. He is a member of the cabinet and either a deputy or a senator. His control extends to all orders of public instruction, military and naval schools excepted, and to all officers charged with the inspection of public schools and higher institutions. The Minister decides upon all disputed questions, revises the decisions of his subordinates, and, by means of his officers or other persons designated by him for the purpose, supervises private schools and institutions of instruction and education. In the case of refusal to conform to the laws, he may order the schools to be closed, after consulting the Higher Council. Next in importance to the Minister is the Undersecretary of State for Public instruction, who takes charge of the affairs intrusted to him by the Minister, substitutes for him during his absence, and may represent him in the Chamber of Deputies and the Senate.

The highest body dealing with public instruction is the Higher Council (*Consiglio Superiore*). According to Act 496, of 1909, this Council consists of thirty-six members, chosen as follows: six senators elected by the Senate, six deputies elected by the Chamber (senators and deputies so elected must not be university professors), twelve members nominated by the Minister, and twelve designated by ordinary and extraordinary university professors. Members are selected or appointed for four years and cannot be reëlected within two years from the close of their terms of service; half of the Council is renewed every two years. Before the passing of this act, there were only thirty-two members, none of whom were elected by Senate or Chamber. The change was bitterly opposed by many professors, who feared that senators and deputies would bring politics into the Council. The Minister is the chairman of the Council. A Vice-President is appointed by the King for two years. The Council meets regularly twice a year, in spring and fall, but the Minister may call an extra session at any time. The Council in committee of the whole at the request of the Minister prepares and examines all bills, by-laws, and general provisions relating to the organization of schools, appointment of professors, etc. The Minister cannot dismiss or suspend a professor unless the Council concurs.

Within the Council there is a committee (*Giunta*) of fifteen members appointed by the Minister from the councilors. To this committee, which meets once a month and may be called together by the Minister or Vice-President at any time, all affairs pertaining to higher education not coming before the full council are referred. Affairs of special moment are first considered by a section of at least five members of the committee who submit their report to the full committee for a final discussion. A special section of the committee, created by an act of 1906, deals with matters pertaining to secondary education. This section is composed of four councilors, members of the committee (one being chairman of the committee of the section), appointed by the Minister; one director and two teachers of government secondary schools, who must have taught seven years, and one director or teacher of schools, recognized as equivalent to government schools, elected by the directors and teachers of those schools. Another special section of the committee, created by the act of June 4, 1911, deals with matters pertaining to primary education. This is composed of three members of the Higher Council appointed by the Minister, the director general of elementary education, a head master and a teacher of normal schools elected by all head masters and teachers, an inspector selected by the Minister, a director of primary education and two elementary teachers selected by all directors and teachers, and another member with a knowledge of education appointed by the Minister.

The Ministry of Public Instruction is also assisted by permanent committees which advise on particular subjects. Among these are a central committee for diffusion of education in southern Italy and Sardinia and Sicily (*Commissione centrale per la diffusione dell' istruzione elementare nel mezzogiorno e nelle isole*) and a committee to pass on all controversies relating to primary education (*Commissione consultiva per le controversie relative all' istruzione primaria*).

The Ministry of Public Instruction is divided into four bureaus (*Direzioni generali*),— elementary and normal education, secondary education, higher education, and fine arts respectively; and two independent divisions (*Divisioni*) with a total of 191 employees of higher grade, including 26 inspectors, 62 accountants, 128 minor clerks. All employees are subject to the general act 290 of June 25, 1908. They are appointed by competitive examination, and vacancies are filled by promotion, those of higher grades by examination. The chiefs of bureaus are chosen by the council of Ministers; they may also be persons not belonging to the administration.

The salary of the Minister is 25,000 lire, of the undersecretary 12,000, of chiefs of bureaus (*Direttori generali*) 10,000 lire. That of higher grade clerks and accountants varies from 2000 to 8000 lire, that of minor clerks from 1500 to 4000 lire. (1 lire = 18 cents.)

Local administration. — In each province there are: (*a*) A *Provveditore* who has charge of everything relating to public instruction in the province. The sixty-nine *Provveditori* have salaries varying from 5000 to 8000 lire. (*b*) A *Consiglio provinciale scolastico* (Provincial education council) of fifteen members including the *Provveditore*, who is the chairman, representatives of the *Consiglio provinciale*, of the *Consigli comunali*, of teachers, etc. The *Consiglio* has the general supervision of elementary schools and the direct administrations of schools for most of the *comuni* (see below). (*c*) A *Deputazione scolastica* (Education committee) of seven members including the *Provveditore*, who is the chairman.. It prepares the budget and all affairs to be submitted to the *Consiglio*. (*d*) A *Delegazione governativa* (Governmental committee) which revises the accounts of the *Consiglio*. (*e*) A *Giunta provinciale per le scuole medie* (Provincial council for middle schools) which has the general supervision of secondary schools of the province.[1]

Istituti tecnici and *nautici*, and schools under the Ministry of Agriculture, Industry and Commerce are not under the *Giunta*, but each of them has a special supervisory committee, that of the former called *Giunta di vigilanza*. Universities and schools of university rank are independent of local authorities.

Primary Schools. — Under the Casati act all *comuni* had the direct administration of their schools, the state contributing to the expenses and having the general supervision. In this respect the act of June 4, 1911, has made radical changes. *Comuni capoluogo di provincia* and of a *circondario* or *distretto*, the last, if they have a population of more than 10,000, will retain the administration of their schools. The *capoluoghi di circondario* or *distretto* may within three years from the promulgation of the act waive the right to administer their schools. *Comuni* which by the census of 1911 have less than 25 per cent of illiterates, provided they have fulfilled all requirements of the laws relating to elementary education for the last five years, may retain the administration of their schools, but are not obliged to do so. Schools of other *comuni* will be administered by the *Consiglio provinciale scolastico*.

The Casati act provided for a full system of elementary education, though not compulsory. According to it elementary schools were divided into two grades, each completed in a term of two years, the child entering the first class at the age of six or seven. The course of study of the lower grade covered religious instruction, reading, writing, elements of arithmetic, Italian language, and elements of the metric system. That of the higher grade included, besides the subjects of the lower grade: composition, penmanship, accounting, elements of geography, the most important events of national history, the elements of physical and natural sciences, chiefly in their application to everyday life; also in the higher grade schools for boys the elements of geometry and geometrical drawing; in those for girls, needlework.

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[1] The *Deputazione*, *Delegazione*, and *Giunta* were created by the act of June 4, 1911. Formerly the *Consiglio provinciale*, differently composed, had supervision of primary and secondary education.

Compulsory education was established by the act of July 15, 1877, known as the Coppino act, which required all children to attend school from six to nine, or ten, if they did not pass the prescribed examination. By this act the subjects of instruction for the three compulsory years were elements of civics, reading, penmanship, the rudiments of the Italian language, arithmetic and the metric system. The omission of religious instruction excited much opposition, but without effect. The obligation placed by the earlier act upon *comuni*, having a population of over 4000 or possessing a secondary school, to maintain elementary schools of the higher grade, was not changed by the Coppino act.

At the time of the passage of the act of 1904 (Orlando act) there were: (*a*) *comuni* which had established the whole course of five classes either because obliged to do so, or voluntarily; (*b*) *comuni* which had established schools with four classes though not obliged to establish the fourth; (*c*) all other *comuni* having only the three classes of the lower grade. The act of 1904 changed nothing as to the *comuni* of division (*c*), but it required those of division (*a*) to establish within three years a sixth class, reducing the teaching hours to three daily in the fifth and sixth classes, and assigning both of them to one teacher. In these *comuni* the age limit was extended to the twelfth year unless the Minister recognized that the expense involved was too great. The act forbade *comuni* of division (*b*) to close any of the schools voluntarily opened; here compulsory education has been extended to all existing school classes. *Comuni* of divisions (*a*) and (*b*), which had voluntarily opened classes of the higher grade and charged a fee, have been authorized to maintain the fee, though attendance has been made compulsory.

The syllabus for the fifth and sixth classes covers: Italian language, Italian history of the nineteenth century, civics, geography, arithmetic, geometry, accounting, domestic economy, natural sciences and hygiene, penmanship and drawing, and, in schools for girls, needlework. Singing, manual training, agriculture, and other subjects may be added by the *comuni*. Pupils intending to enter secondary schools leave the elementary schools at the end of the fourth year, when they take a special examination called *maturità* examination at ten years of age, for which a fee of fifteen lire is charged; pupils who have followed the whole course of six classes may be admitted, under certain conditions, to the second class (year) of the *Scuola tecnica*.

The act of 1904 made more stringent provisions for enforcing compulsory school attendance and provided for the establishment of 3000 evening and Sunday schools for illiterate adults in those districts where the number of illiterates is highest. Special provisions for the diffusion of elementary education in the southern and central provinces were made by a later act of 1906.

The act of June 4, 1911, has gone much farther toward improving the conditions of elementary education; under its provisions the state assumes a larger part of the expenses. In each *comune* a *patronato scolastico* is established in order to further encourage attendance and efficiency by the distribution of free meals, clothes, establishments of libraries, etc.

Teachers. — Teachers in *comuni*, which retain the administration of their schools, are appointed by the *Consiglio comunale* with the approval of the *Consiglio provinciale scolastico.* Those of other *comuni* are appointed by the *Consiglio provinciale scolastico.* Salaries in force from Jan. 1, 1912, have been fixed by the act of June 4, 1911, and range from 1200 to 1700 lire for teachers in graded schools, *i.e.* in larger *comuni*, for boys or boys and girls, and from 1050 to 1500 for teachers in graded schools for girls. For schools not graded, namely, in very small villages, salaries are 500 and 800 lire. Teachers in charge of two classes have an extra compensation of 300 lire. All teachers have four increases, equal to one tenth of their salary, once every six years. Some of the *comuni* pay considerably higher salaries. Rome pays from 1800 to 3100 lire; Milan from 1850 to 2900 for men and 2600 for women; Venice from 1700 to 2200 for men and 1400 to 1800 for women. Legally no one can be appointed as a teacher unless he has secured a diploma; but the appointment can and often does go temporarily to any one who, in the estimation of the *Provveditore*, is able to take charge of the class. The teacher is first appointed for a term of three years; if reappointed, he can be dismissed only for cause. No man can be appointed teacher under eighteen years of age, and no woman under seventeen years of age. All teachers receive a pension upon retirement, either from a special pension fund established for that purpose or from the *comuni*, if the *comuni* had provided a system of pensions before the pension fund was created. *Comuni* contribute to this fund five per cent of the salaries paid to their teachers. The teachers pay four per cent. The state also contributes.

To supervise elementary schools there are *direttori didattici* (school directors in the *comuni*, who have the administration of their schools; sub-inspectors (1000 in the whole country newly established by the act of June 4, 1911, at salaries from 2000 to 2400 lire, part of them replacing *direttori didattici* of smaller *comuni*); and over them inspectors (400 in number at salaries from 2500 to 4500). There are also ten central inspectors connected with the Ministry with salaries of 6000 and 7000 lire.

Cost of Education. — The expenses for elementary schools are borne by the *comuni* with contributions from the State. In 1899 the State paid nearly 4,000,000 lire, the provinces less than 400,000, and the *comuni* 64,000,000, making a total of 68,400,000 lire. This is less than three lire per capita while at the same time the expenses of Great Britain and the United States were nearly twelve lire and those of Germany over nine per capita. Under the Education Acts of 1886 and 1900, and more especially those of 1904 and 1906, the State has increased its share of the expenditure. It amounted to nearly fourteen million lire for the fiscal year 1906–1907, to nearly eighteen for 1907–1908, to twenty in 1908–1909, and to nearly twenty-four million in 1909–1910. The act of 1906, applying to southern and central Italy, Sicily, and Sardinia, provided for more than 18,000 new schools at an expenditure of more than 18,000,000 lire, of which above 11,000,000 will be contributed by the state and 7,000,000 by the *comuni*. Five years were allowed for carrying out the provisions of this act. The act of June 4, 1911, has further provided that within three years all rural schools shall be reorganized. The higher expenses caused by the increase of salary of teachers, and the establishment of new schools will fall upon the State. The Bank of Deposit and Loans will lend to the *comuni* 20,000,000 lire a year for twelve years and the State will pay the interest on this sum. It is estimated that the total expense of the State will rise from nearly 34,000,000 lire for the fiscal year 1910–1911 to nearly 74,000,000 lire for the fiscal year 1920–1921. The share of the expenses for the *comuni* whose schools will be administered by the *Consiglio* will be fixed at the highest figure of their expenses for schools for the years 1909 or 1910 and turned over to the *Consiglio*.

Statistics. — Recent statistics cover only government schools and those recognized as equivalent to them. General statistics are not issued oftener than five-year periods. The last statistics covering all kinds of schools relate to the school year 1901–1902 for normal and *complementari* schools and special schools for girls; those for all other schools are much older. The most recent general statistics available are for 1907–1908.

Additional schools needed above number for 1907–1908, 27,000. State of schoolrooms (1907–1908): good, 21,028; poor, 20,233; unsatisfactory, 18,806; total, 60,067.

STATISTICS OF PUBLIC ELEMENTARY SCHOOLS

School Year	Schools (i.e. grades)	Teachers	Pupils
1871–1872 . . .	33,556	34,309	1,545,790
1877–1878 . . .	39,702	39,702	1,830,749
1882–1883 . . .	42,390	43,659	1,873,723
1887–1888 . . .	42,247	47,998	2,125,207
1892–1893 . . .	49,722	51,385	2,291,966
1901–1902 . . .	53,259	56,433	2,548,583
1907–1908 . . .	63,618	60,323	3,002,168

Pupils. — The total number of children from six to twelve years of age was 4,500,000 (estimated); obliged to attend school 3,949,141 (1907–1908); enrolled in public schools, 3,002,168, or 93 per cent of population.

SCHOOL YEAR 1907-1908

Grades	Pupils enrolled	Pupils who passed the Final Examination
1st	1,260,317	633,378
2d	856,587	479,792
3d	607,317	310,846
4th	181,323	106,656
5th	77,875	52,751
6th	18,749	13,052
Total . .	3,002,168	1,596,475 or 58.90 per cent of pupils enrolled.

EXPENDITURE (LIRE)

Fiscal Year	State	Comuni		Per cent of total expenditure	Per capita
		Calendar year	Total		
1903–1904	5,756,171	1899:	66,350,966	14.18	2.07
1910–1911	26,791,116	1909:	136,023,760	15.52	4.00

EVENING AND SUNDAY SCHOOLS FOR ADULTS

Established under Acts of 1904 and 1906, 4783 (1907–1908.)

Enrolled		Who took the Examination	Who passed it
Men	148,233	78,314	61,543
Women	34,140	19,689	16,174
Total	182,373	98,003	77,717

Private Schools (1907–1908): schools, 3504; Grades, 11,904; schoolrooms, 6534; pupils, 148,081; principals, 2063; teachers, men, 1318; women, 4749; total, 6067.

The number of private schools is about the same as reported for 1901–1903, the number of teachers has decreased. Kindergartens for 1907–1908[1] numbered 4967; teachers were 7393; pupils were 378,563.

Secondary Education. — *General Regulations.* — The secondary schools are regulated by the Casati act, but the full provisions of that measure, as regards the number, location, and support of the several classes of secondary schools, have never been realized. As a rule the buildings and equipments for the secondary schools are provided by the local authorities and the current expenditures by the state and local authorities; the proportion borne by the latter having been fixed by an act of 1904 and amending act of 1907, for the schools taken over by the state hereafter.

In the normal and *complementari* schools the salaries of teachers, the expenses for scientific and teaching material for the laboratories and for the library are paid by the state; the salaries of teachers in the elementary schools, the cost of the building, its care and janitors' salaries are paid by the *comuni*. Any one having the moral qualification may open a secondary school provided he gives notice to the *Provveditore* or the chief of the *Giunta* (Committee) of the *Istituto tecnico* of the province, if he wishes to open such a school, or to the Minister, if there is no *Istituto tecnico* in the province. Teachers must have diplomas. The students of private secondary schools must pass the government examinations to secure the recognition of their studies. *Comuni* provinces and other public corporations may establish secondary schools; such schools may under certain conditions be recognized as equivalent to government schools.

Types of schools. — The secondary schools are classified as follows: —

(I) Classical schools and modern schools with Latin: (*a*) *Ginnasio* — five years' course; (*b*) *Liceo* — three years.

(II) Modern schools without Latin, and technical schools: (*a*) *Scuola tecnica* and *Scuola complementare* — three years; (*b*) *Istituto tecnico* — four years; and *Istituto nautico* — three years.

(III) Normal schools: (*a*) as II; (*b*) *Scuola normale* — three years, or (*a*) as I; (*b*) *Corso magistrale* — two years.

Ginnasio, *scuola tecnica*, and *scuola complementare* are schools of the first grade; *Liceo*, *istituto tecnico*, *istituto nautico*, and *scuola normale*, of the second grade. In cities having *ginnasio* and *liceo* the two institutes are combined in one *liceo-ginnasio*. Candidates for admission to a secondary school must pass the *maturità* examination.

The full classical course, it will be seen from the above outline, covers eight years; the full modern course, seven years. Girls are admitted to all secondary schools on the same terms as boys, but the *scuola complementare* is exclusively for girls. The plan of studies for the *ginnasi* includes Italian, Latin, Greek, French, history, geography, mathematics, natural history; that of *licei*, philosophy, physics and chemistry and the subjects taught in the *ginnasi* with the exception of French. The plan of studies of the "modern" *ginnasi* established by act No. 860 of July 21, 1911, includes Italian, Latin, French, German or English, geography and history, mathematics, natural history, drawing, and physical culture; that of the *licei* includes in addition: political economy, philosophy, elements of civics, physics, chemistry, astronomy, and physical geography. These new schools will be established in those cities having more than one *liceo-ginnasio*, and only the fourth class of the *ginnasio* will be established for the school year 1911–1912, the fourth and fifth in 1912–1913 and so on. The studies of the *scuola tecnica* are Italian, history, the elements of civics, geography, French, mathematics, the elements of natural sciences, drawing, penmanship. A few schools have special courses comprising besides the above with slight changes, (*a*) agriculture, (*b*) accounts and English or German, (*c*) the elements of mechanics and technology. These new plans have been established recently (1899) and in a few schools only. The studies of the *scuola complementare* include: Italian, geography, Italian history, the elements of mathematics and accounting, the elements of natural and physical science and hygiene, French, drawing, needlework, gymnastics. There are also numerous special schools for girls, mostly boarding schools, with plan of studies similar to those of *scuole complementari*.

Technical schools (*istituti tecnici*) are divided into sections (*sezioni*). The three most important are: (*a*) physico-mathematical section (*sezione fisico-matematica*), (*b*) surveying, building and agricultural section (*sezione di agrimensura*), (*c*) accounting and commerce section (*sezione di commercio e ragioneria*). A few *istituti* have also (*d*) agricultural section (*sezione di agronomia*), (*e*) industrial section (*sezione industriale*). The plan of studies for all sections includes Italian, history, geography, French, drawing, logic and ethics, natural history, physics and chemistry, and mathematics; the various subjects, however, do not cover the same ground for all sections. Additional subjects are, for section (*a*) higher branches of mathematics, and German or English; (*b*) agriculture, building and drawing, real estate and building law, surveying and drawing and descriptive geometry; (*c*) accounting; commercial, administrative, and civil law; political economy; finance and statistics; English or German. Sections (*d*) and (*e*) have special programs.

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[1] Kindergartens are regarded as charitable institutions, and therefore are under the supervision of the Minister of the Interior; the State grants them subsidies from a special appropriation for that purpose.

The Nautical Institutes are divided into three sections: (*a*) engineering section, (*b*) nautical section, (*c*) shipbuilding section (for small crafts only). The plan of studies for all sections includes, though in different measure, Italian, history, mathematics, physics, mechanics, English. Also for section (*a*) applied mechanics, steam engines, drawing, materials of construction and fuels, engineers' duties, and ship practice; for section (*b*) navigation, seamanship, astronomical geography and nautical astronomy, steam engines, meteorology, commercial geography, maritime law and accounting; for section (*c*) applied mechanics, steam engines, naval construction and drawing, material of construction, theory of the ship, law.

Connected with the technical and nautical schools there are evening courses, and with the nautical schools also preparatory schools, and special courses at one of them (*Piano di Sorrento*) for foremen in shipyards.

The plan of studies for the normal school for boys includes pedagogy, ethics, Italian, history, geography, the elements of mathematics, accounting, physics, chemistry, natural history, and hygiene, drawing, penmanship, singing, agriculture, gymnastics, practice in elementary schools, and manual training. The normal schools for girls include all above subjects, except manual training and needlework, domestic economy, and practice in the kindergarten. Owing to the scarcity of men teachers special two years normal courses (*corsi magistrali*) have been established in towns having *ginnasi* only, by act of July 21, 1911. Boys and girls will be admitted if they have passed the *licenza* examination of the *ginnasio*. Not more than fifteen of such courses may be opened during 1911–1912, 1912–1913.

Examinations. — Under the examination bylaws of 1904 all pupils as a rule undergo three examinations, written and oral or only oral, during the school year, in December, March, and June. Marks are given to each pupil by the teacher of each subject on general efficiency during the three months preceding each examination, and on all examination papers by the teacher of the subject and another teacher. The highest mark is ten and the pupil who averages six in the above examinations and seven for good behavior in all subjects is admitted to the next class (*i.e.* year of study); if he does not average six, he must present himself for examination in October. If he fails to pass, he must repeat the year of study and he must also do so, if he gets less than five marks for good behavior in more than one half of the number of subjects.

At the end of each school course the pupil must pass a special examination called *licenza* examination, unless he has obtained eight marks in the examinations during the last year. The *licenza* from the *ginnasio* is required to enter the *liceo,* that of the *scuola complementare* or *scuola tecnica* to enter the *istituto tecnico* or *nautico* or the *scuola normale.* Admission to the *Istituto tecnico* is obtained also through special examination. A *licenza* certificate from a government or equivalent school is necessary to take the civil service examinations or to enter the universities or higher schools.

Pupils studying at private schools may take an examination to enter any class of the schools, except normal schools, or the *licenza.* If they wish to enter the second class of a school of the first grade, they must have passed the *maturità* examination at least one year before; if the third class, at least two years before, etc. If they wish to enter the second class of a school of the second grade, they must have passed the *licenza* examination of the corresponding school of the first grade one year before; if the third class, two years before, etc. Admission to the second or third year of the normal school cannot be obtained by any but regular pupils of a government school.

Fees. — The fees to be paid by pupils of government, or equivalent schools, for the whole course including examination fees (part of which is reserved to the teachers), vary from 106 to 409 lire. Clever pupils, if in needy circumstances, are exempted from payment. Pupils who have studied privately pay higher examination fees.

Teachers. — No one can be appointed teacher in any government or equivalent schools or teach in any private school unless he has a degree granted from a university or school of the same standing, or a special diploma, which can be granted only after examination and for such subjects as are not taught in universities. These are modern languages (though there are some courses at a few universities), drawing, accounting, penmanship, and stenography. The status and compensation of teachers in government and equivalent schools are regulated by the two acts of April 8, 1906, nos. 142 and 144, which fixed the rules to be followed in appointing, dismissing, transferring from one place to another, censuring, etc., any teacher. The first appointment is for three years, after which it is made permanent, if the inspectors report favorably; if not, the appointment is extended for another year, when the teacher is definitely appointed or dismissed. During this probationary period the teacher (*professore*) is called extraordinary (*straordinario*); after the definite appointment, ordinary (*ordinario*). Not all places, however, are filled by teachers so appointed. In certain cases, when a teacher would have only a few hours a week, a temporary appointment is made. Such appointments are also made if a regular appointee cannot be found for the place, and in schools with a large number of pupils, when it is necessary to divide classes and the regular teacher cannot take charge of all. As a rule, a teacher is appointed for a single study or for two related subjects.

Salaries. -- The scale of salaries paid to teachers in secondary schools varies considerably with the subject taught. Here only the salaries paid to teachers of subjects which are definitely secondary are given. (*a*) All teachers of secondary schools of the first grade, with the exception of teachers of the fourth and fifth class (year) of the *ginnasi*, and teachers of drawing and penmanship in the normal schools for boys, and of drawing in the normal schools for girls, have salaries of 1800 lire if extraordinary, and from 2000 to 4800 if ordinary. (*b*) All other teachers of secondary schools of the second grade and those of the fourth and fifth class of the *ginnasi* have salaries of 2200 lire if extraordinary, and from 2500 to 5400 if ordinary.

All ordinary teachers have four increases in salary of 500 lire each, every five years. Then two increases, one tenth of the salary thus reached, each at six years interval. In this way they pass from the minimum to the maximum salaries, as given above. The four fixed increases, but not two consecutive ones, can be anticipated one year in case of exceptionally able teachers.

Teachers, like all the government employees, receive pensions on their retirement from service.

Teachers of class (*a*) have to teach from fifteen to eighteen hours, of class (*b*) from thirteen to fifteen hours, of the other classes a number of hours which varies from four to fifteen, according to the subjects. If they teach more, they receive extra pay. Extra pay, varying from sixty to one hundred and fifty lire a year, is also granted to those teachers who have charge of laboratories or have to correct exercises at home, etc. All receive part of the examination fees paid by the pupils.

Headmasters are appointed from teachers who have taught for thirteen years and from a list compiled by the *Giunta del Consiglio Superiore, sezione scuole medie*, in accordance with results of the inspections. They are appointed for a first period of five years during which they teach and receive extra compensation varying from 750 to 1000 lire a year. After the probationary period, they are permanently appointed and receive salaries not higher than 5750 lire for schools of the first grade, and 6500 for schools of the second grade, and they may be relieved from teaching.

Schools equivalent to government schools must pay the same salaries.

Inspection. — A new body of inspectors for secondary schools was formed by Act 414 of June 27, 1909. For the purpose of this act the whole of the kingdom is divided into twenty-one districts. In September each year by order of the Minister, inspectors are assigned to each district; for certain subjects one inspector may be assigned to more than one district. The appointments are for a year and may be renewed for two following years, after which one year must elapse before the appointment can be renewed.

Inspectors are chosen from among (*a*) Professors of universities and schools of the same rank, (*b*) *Provveditori*, (*c*) Heads of secondary schools situated in another district, (*d*) Ordinary teachers of the second grade of secondary schools having taught at least ten years and teaching in schools outside of the district for which they are appointed inspectors. *a* and *b* inspect second-grade secondary schools, and *c* and *d* first. Inspections are made according to need, but there is a regular inspection in each school for each subject once in five years. The purpose of the inspection is to ascertain whether the course of study has been followed and to report on textbooks and to superintend the discipline and the method of teaching; to make, according to the results of the inspection, the needed recommendations for the final appointment or dismissal, approval or censure of teachers; to give any information required by the Ministry concerning any teacher. At the end of each school year the inspectors of each district meet and compile a collective report in which are stated the conditions and needs of the schools.

At the Ministry there are ten inspectors for secondary schools; six are permanent and are appointed from among officers of classes (*a*), (*b*), and (*c*). Four are appointed yearly and reappointed for not more than five years. The central inspectors, besides special duties that may be assigned to them from time to time, compile the general program of inspections to be submitted to the Minister; coördinate the results of inspections; recommend to the Minister the needed changes on the basis of those results; propose to the Minister extraordinary inspections, general and particular inquiries and, if needed, carry them out; promote investigations relating to course of study and method of instruction; present to the Minister yearly a general report on secondary schools.

Fine Arts and Music Schools. — Government fine arts and music schools are under the direction of the Minister of Public Instruction. They have not a uniform organization and vary in importance in every respect. The number of fine arts government schools was thirteen in 1901–1902 with 2433 pupils (2137 boys and 296 girls). The non-government schools were thirteen with 1625 pupils (1363 boys and 262 girls). The former had 167 teachers, the latter 65.

The government music schools were five in number with 952 pupils (353 boys and 419 girls); the non-government 51, with 4431 pupils (3408 boys and 1023 girls). The number of teachers in the former was 146, in the latter 395.

Agricultural, Industrial, and Commercial Schools. — Notwithstanding article 1 of the Casati Act, which says all schools are under the Ministry of Public Instruction a great number of schools have been established under the supervision of the Ministry of Agriculture, Industry, and Commerce. They are practical schools of agriculture, commerce etc.

The schools of agriculture are regulated under the act of June 6, 1885, No. 3141. They are established at the suggestion of local authority (*comuni*, province, etc.) which pay two fifths of the expenses besides providing an experimental farm, while the state pays three fifths. Each school is managed by a committee whose members are appointed partly by the government and partly by the local bodies sharing in the expenses. They are classified as either practical or special schools. The course of study of the practical schools covers three years, and includes: Italian, history, geography, arithmetic, geometry, surveying, drawing, accounting, bookkeeping, penmanship, natural and physical sciences, agriculture and related industries. Some have a fourth year of practical studies.

To be admitted, boys must have passed the examination for admission to the fourth class (year) of the elementary schools, but though that examination is usually passed at the age of nine to ten, boys are not admitted to the agricultural schools until they are at least fourteen and not after they are seventeen. The boys may board on the school farm. The staff of each school includes, as a rule, a director, a vice-director, an elementary school teacher and an assistant, besides extraordinary teachers for special subjects.

Special schools of agriculture are of two grades. Those of the first grade are organized like the practical schools with this difference, that instead of agriculture in general, particular branches are offered, *i.e.* dairying at Reggio, horticulture at Florence, vine raising and wine making at four schools. The four of the second grade, all for vine raising and wine making, are in their plan of studies similar to sections of *istituti tecnici*. Boys are admitted if they have passed the final examination of a practical school or a special school of the first grade or of a *scuola tecnica*.

Commercial and industrial schools are governed by the by-laws of June 1, 1908, No. 187. They are established on the suggestion of local bodies (*comuni*, province, chambers of commerce, etc.), which share the expense, the Minister of Agriculture contributing within the limits of the total appropriation for that purpose. These schools are divided into: (*a*) industrial schools, *i.e.* manual training schools; (*b*) artistic-industrial schools; (*c*) commercial schools; (*d*) schools for girls.

There are two grades of each class corresponding to the first and second grade of the secondary schools. Their plan of studies varies greatly, ranging from schools of drawing with one teacher to a school fully equipped like the *scuola industriale* of Vicenza or like the *scuole medie di commercio,* which correspond in all respects to a section of *istituto tecnico*. In the majority of these schools the teaching takes place on evenings and Sundays. The total number of these schools, which receive grants from the government, was 310, with more than 47,000 pupils in 1903–1904. The total expense for that year was more than 3,000,000 lire, of which about 700,000 was paid by the state and more than 800,000 by the *comuni*. The number of teachers was over 2000. There were 427 schools, which did not receive any grant from the government.

All these agricultural, commercial, and industrial schools are under the supervision of a special committee, the *Consiglio superiore dell' insegnamento, agrario, industriale e commerciale* which was established in 1907 by the amalgamation of two previously existing, one for agricultural and the other for commercial and industrial schools. There is also a body of inspectors, and the Minister may appoint other persons, whom he thinks suitable, for special inspections.

There are also three mining schools which rank as secondary schools of the second grade.

Boarding Schools. — The schools referred to above are day schools. Boarding schools are for the most part private institutions. There are a few government institutions (those for boys called *convitti nazionali*), where pupils may board and follow the courses at the public secondary schools or the elementary schools.

Reform. — Ever since the promulgation of the Casati act the reform of the secondary schools has caused much discussion. Since then some changes have been introduced in the plan of studies by one Minister and changes in the opposite direction by another. Many bills have been introduced into Parliament for a general reform, but none has become a law.

In 1906 a Royal Commission was appointed to investigate the whole subject of secondary education. They have issued a report including a proposal for a new organization. The idea of a single secondary school for the first grade, which not long ago obtained, has been abandoned, and they propose for the first grade: (*a*) A three years' *ginnasio* for those who intend to pass to the *liceo* and then to the universities; the plan of studies including Italian, French, history, geography, psychological education, elements of mathematics and natural sciences, drawing. Boys and girls will be admitted if they are ten years old and have passed the *maturità* examination. (*b*) A *scuola tecnica* preparing for the professional school of the second grade. Boys and girls will be admitted if they have passed the *maturità* examination. (*c*) A *scuola complementare* for those who do not intend to pass to schools of the second order. Admission to be gained after the sixth year of study in the elementary schools.

For the second grade they propose: (*a*) A *liceo* with a five-year course for those who intend to pass to the university. They propose three different kinds of *liceo:* (1) classical *liceo* with Latin, Greek, and French; (2) modern *liceo* with Latin, French, and English or German; (3) scientific *liceo* without Latin, which would take the place of the physico-mathematical section of the *istituto tecnico.* (*b*) Professional schools taking the place of the professional sections of the *istituto tecnico* and of the special schools of the second grade now under the Ministry of Agriculture.

Higher Education. — Higher education is given at the universities (*università*) and at other institutions the majority of which are designated as schools (*scuole*) or institutes (*istituti*). Some of these institutions are connected with universities, others are entirely independent. If under the control of the government, the universities are called *regie;* if under local bodies, *libere*. All universities are governed by the same laws and by-laws, the other institutions by special laws and by-laws.

The faculties, all of which are found in the largest universities, are: (1) law, (2) medicine and surgery, (3) mathematical, physical, and natural sciences, (4) belles-lettres and philosophy. In addition, there are schools in the following subjects: pharmacy, engineering, veterinary science, agriculture, commerce and social sciences, oriental languages, midwifery; and courses for notaries and attorneys, for secondary and elementary school teachers, and schools for women. All commercial schools, the agricultural schools at Milan, Portici, and Perugia, and the forestry school at Vallombrosa are under the Ministry of Agriculture, Industry, and Commerce; all other institutions are under the Ministry of Public Instruction.

The following is a list of institutions with the date of foundation, faculties, and number of students in 1910–1911.

Maintenance. — The expenses in the various institutions are borne by the State, local bodies contributing in different ways. By act of 1862 the universities of Genoa, Parma, Modena, Siena, Macerata, Cagliari, Sassari, Messina, and Catania were made universities of the second rank. To have them raised to first rank local bodies agreed to pay to the State the difference involved in the salaries of teachers, and in a few cases to have the faculties completed. Local bodies of other cities contribute funds to establish schools either in connection with universities or as independent institutions. These contributions are of a permanent character. Other extraordinary payments have been made for new buildings or other extraordinary expenses. Free universities are supported entirely by local bodies, except Urbino, which receives a small subsidy from the State. The Institute of Social Sciences of Florence and the Commercial University of Milan are supported by private gifts.

To all other commercial schools, to the Polytechnic School at Turin, the School of Naval Engineering at Genoa, the Higher Institute of Florence, and the Clinical Institute at Milan, the State contributes a fixed sum. All these institutions are administered by special boards in which local bodies are represented, but professors are appointed by royal decree or ministerial selection. The School for Oriental Languages at Naples has a patrimony of its own administered by the Minister of Public Instruction; also the Institute of Agriculture of Perugia.

The general by-laws regulating the universities and some of the other institutions are those of Aug. 21, 1905, No. 638.

Administration. — For each university there are the following: (*a*) a principal (*Rettore*); (*b*) an academic council (*Consiglio accademico*); (*c*) a general assembly of professors (*Assemblea generale dei professori*). For each faculty: (*a*) a dean (*Preside*); (*b*) a council of professors (*Consiglio di facoltà*). Special schools have, as a rule, an organization like the faculties; the head, however, is usually called director (*Direttore*).

Rector. — The *Rettore* is chosen by the king from three ordinary professors nominated by the general assembly of professors; he is appointed annually and may be reappointed. In Naples he is elected by the professors from three ordinary professors selected from the various faculties in turn; the election has to be approved by the Minister. The *Rettore* is appointed for two years. He is the chairman of the academic council and the assembly of professors; represents the university on all occasions; confers degrees in the name of the king; communicates his decisions, those of the academic council, the faculties councils, the general assembly of professors and the Minister to all concerned; sees that all by-laws are adhered to; looks after the administration by means of the secretary of the university and other employees; inspects the university library and all institutions belonging to the university; regulates the discipline of professors, students, and employees; and compiles a yearly report to the Minister; and grants leave of absence.

Councils. — The academic council is composed of the following: (*a*) the *Rettore* in office; (*b*) the retiring *Rettore;* (*c*) the deans of the faculties; (*d*) the retiring deans; (*e*) the director of the schools connected with the university. Among other functions the council (*a*) grants scholarships and makes proposals for state scholarships; (*b*) gives its advice on changes relating to the university regulations or any subjects submitted by the *Rettore* or the Minister; (*c*) fixes the time schedule for classes; (*d*) grants dispensation from payment of fees; (*e*) decides upon the disposal of funds.

The general assembly of professors, both ordinary and extraordinary, gives its advice on reforms in universities, and nominates the three

Town	Date	Institution	Faculties	Enrollment
Aquila	1806	University School	courses for notaries, pharmacy and midwifery	39
Bari	1806	(*a*) University School	as Aquila	85
	1886	(*b*) Higher Commercial School		130 (1906–1907)
Bologna (*q.v.*)	1088	R. University	all; and schools of agriculture, and veterinary surgery	1520
	1877	Engineering School		166
Cagliari (*q.v.*)	1626	R. University	law, medicine, sciences,[1] school of pharmacy	243
Camerino	1727	Free University	law, medicine,[1] schools of pharmacy and veterinary surgery	406
Catania	1434	R. University	all; school of pharmacy	1048
Catanzaro	1806	University School	as Aquila	21
Ferrara (*q.v.*)	1391	Free University	law, medicine,[1] sciences,[1] school of pharmacy	490
Florence (*q.v.*)	1349	R. Higher Institute	medicine, letters, and philosophy, sciences,[1] school of pharmacy	482
	1882	Higher Institute for Women		135
	1875	R. Institute for Social Sciences		105 (1909–1910)
Genoa	1243	R. University	all; schools of pharmacy, and engineering[1]	1024
	1870	R. School of Naval Engineering		130
	1884	Higher School of Commerce		119 (1905–1906)
Macerata	1290	R. University	law	435
Messina	1549	R. University	law only since earthquake	229
Milan	1859	R. School of Engineering		875
		R. Faculty of Letters and Philosophy		86
		R. School of Veterinary Surgery		50
	1870	R. School of Agriculture		91 (1908–1909)
	1902	University of Commerce		99 (1908–1909)
	1905	Clinical Institutes		——
Modena	1678	R. University	law, medicine, sciences;[1] schools of pharmacy, and veterinary surgery	522
Naples (*q.v.*)	1224	R. University	all; school of pharmacy	5340
	1810	R. Engineering School		209
	1856	R. School of Veterinary Surgery		131
	1727	R. Institute of Oriental Languages		220
Padua (*q.v.*)	1222	R. University	all; schools of pharmacy, and engineering	1333
Palermo	1805	R. University	all; schools of pharmacy, and engineering	1265
Parma	1512	R. University	as Modena	435
Pavia	1300	R. University	all; schools of pharmacy, and engineering[1]	1137
Perugia	1276	Free University	law, medicine;[1] schools of pharmacy and veterinary surgery	350
	1896	R. Institute of Agriculture		73 (1908–1909)
Pisa	1328	R. University	all; schools of pharmacy, agriculture, and engineering[1]	956
	1810	R. Higher Normal School		(included in above)
Portici	1873	R. Higher School of Agriculture		126 (1905–1906)
Rome (*q.v.*)	1303	R. University	all; school of pharmacy	2847
	1817	R. School of Engineering		308
	1906	R. Institute of Commerce		248 (1907–1908)
	1882	Higher Institute for Women		285
Sassari	1677	R. University	law, medicine; school of pharmacy	176
Siena	1246	R. University	as Sassari	244
Turin	1404	R. University	all; school of pharmacy	1898
	1906	R. Engineering School		1236
	1796	R. School of Veterinary Surgery		59
	1906	R. School of Commerce		57 (1906–1907) 1st. year
Urbino	1671	Free University		312[illegible]
Vallombrosa	1869	R. Institute of Forestry		31 (1908)
Venice	1868	R. School of Commerce		173 (1905–1906)

The totals do not include students following the special course for elementary school teachers.

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[1] Incomplete.

professors whose names are to be submitted to the king for the appointment of the *Rettore*. For this latter purpose representatives of private professors take part, two for each faculty or school.

The dean represents the faculty on all occasions and is the chairman of its councils; acts as intermediary between the faculties and the rector; submits a yearly report from the faculty to the *Rettore* concerning the work and examinations, with his remarks. The dean is appointed for three years and may be reappointed.

The council of ordinary and extraordinary professors of the faculty suggests to the students the order of studies to be pursued, co-ordinates the syllabi submitted by the professors, compiles the schedules for classes proposes new courses, designates the persons fitted to give such courses, and those who may temporarily fill vacant chairs, and proposes the means of permanently filling such vacancies. The council submits to the academic council proposals for changes in the regulations, and submits the names of three professors from whom the king will appoint the dean. The council meets once every two months and may meet extraordinarily when five professors demand it.

Professors. — Professors are ordinary (*ordinari*), extraordinary with a permanent appointment (*straordinari stabili*), extraordinary (*straordinari*), *incaricati*, and private professors (*liberi docenti*). The appointments and transfers of ordinary and extraordinary professors are regulated by the acts of 1904 and 1907. The provisions of these acts apply to all Royal universities and to some of the schools, and are also followed in the main for the others, although their provisions do not apply to them.

The Minister has the right, according to the Casati act, to submit to the king the names of men of exceptional merits for appointment as ordinary professors. This, however, very seldom happens, and both ordinary and extraordinary professors are, as a rule, appointed by selection from applicants according to their qualifications, which are passed upon by a committee of professors. Ordinary professors are appointed by royal decree. An extraordinary professor is appointed for the first time by the Minister for one year, after which he is appointed for a second year and then for a third in consultation with the faculty. When he has been reappointed twice and has taught three successive years, he is made, by royal decree, a permanent extraordinary professor (*straordinario stabile*) after the advice of the higher council has been heard. In engineering schools extraordinary professors may be appointed by the Minister, regardless of the usual formalities. An extraordinary professor having a permanent position may be promoted to ordinary upon the favorable report of a committee appointed in the same way as those who pass upon the applicants for new positions.

Incaricati are appointed by the Minister on the suggestion of the faculty in the case of obligatory courses. For complementary courses the advice of the higher council is also taken. Ordinary and extraordinary professors, those who have been recognized fit to hold chairs as such, those who have occupied chairs, and private professors, may have a temporary appointment as *Incaricato*. Such an appointment lasts not more than one year, but may be renewed.

Besides official professors there are private teachers. To be permitted to teach, one must file an application with the Minister, stating what subjects and at what institutions he wishes to teach. He has to pass a special examination which consists of (*a*) a written dissertation on a subject chosen by the examining committee; (*b*) an oral examination upon that subject and on the science which he intends to teach; (*c*) a lesson. Applicants, however, who have given proofs of a thorough knowledge of the subject may be excused from the examination or from parts (*a*) and (*b*). Such applicants must have published at least one memoir on the subject they desire to teach.

The universities of Turin, Genoa, Sassari, and Cagliari have also *Dottori aggregati*, which correspond to the French *agrégé*.

Salaries. — By an act of 1909 the salary of ordinary professors has been raised from a minimum of 5000 to a minimum of 7000 lire, with periodic increases of 750 lire every five years up to 10,000 lire, and that of extraordinary professors from a minimum of 3000 to 4500 lire with periodic increases for the *stabili* of 450 lire up to 7000. *Incaricati* receive a fee of 30 lire per lesson, if they are ordinary or extraordinary professors; they receive 2000 lire a year, if they are not official professors. This increase applies to all Royal universities and other institutions with the exceptions noted below. The same act fixed the salaries of professors of higher institutes for women at 5000 lire, if ordinary, with increases of 500 lire every five years up to 7000 lire, and at 3500, if extraordinary, with increases of 350 every five years up to 5000 lire. Salaries of professors at the university schools are lower.

The salaries of the professors of the Higher Schools of Commerce, of the School for Oriental Languages, and of the Institute of Forestry have not been changed and are as a rule 5000 lire, with periodical increases of 500 for ordinary, 3000 for extraordinary, and 1200 for *incaricati*.

The Casati act fixed the number of ordinary and extraordinary professors in each Faculty or school, but the act of 1909 has done away with such provision and fixed the total number of professors at Royal universities and other government institutions under the Ministry of Public Instruction, except institutes for women, oriental institutes, and university schools, at 861 ordinary professors and 215 ordinary professors of fundamental subjects and thirty-eight ordinary and twenty-seven extraordinary professors of complementary subjects. New chairs can be established in these institutions only by law, with the exception that those institutions which have a special administration to which the State contributes a fixed sum may change the number of ordinary and extraordinary professors provided no higher charge will result to the State. The number of ordinary and extraordinary professors at the other institutions is separately fixed at each of them. For the *incaricati* compensation a lump sum is appropriated.

A certain number of assistants are attached to universities and schools. The total attached to Royal universities and other government institutions under the Ministry of Public Instruction, except institutes for women, oriental institutes, and university schools, is 1054, and the salaries vary from 1500 to 2400 lire a year. To Royal observatories also are attached assistants, thirty in all, including the observatories of Milan, Naples, and Rome not attached to universities, their salaries varying from 2000 to 5700 lire.

Fees. — Fees were considerably raised by an act of 1903. For the whole course they amount to 1275 lire for the faculty of medicine, 1185 for the faculty of law, 1150 for the engineering schools, 805 for the faculties of sciences and letters, from 950 to 510 for the school of pharmacy, 705 for the courses for notaries and attorneys, 500 for the schools of agriculture, and 510 for the school of veterinary surgery, 110 for the courses for secondary teachers (above faculty fees). Examination fees are included in the above totals and go to the examiners. The increase of revenue, due to the raising of the fees, is applied partly by the State, partly by the universities and schools to increase salaries of assistants, to establish scholarships, to grants for laboratories and libraries.

Those who wish to be authorized to teach privately at universities must pay a fee of 250 lire, and if they wish to transfer from one university to another, they must pay a fee of 100 lire.

Numerous scholarships are granted by the *comuni*, *province*, state and endowed institutions. Among others the State grants every year nine scholarships to be held abroad.

Students. — In order to matriculate as a regular student in a university it is necessary to have the diploma granted to those who have passed the final examination of a *liceo* (or have been excused from it) or, for the faculty of sciences and the schools, that of the physico-mathematical section of a technical institute. The diplomas of all sections of the technical institute admit to the schools of pharmacy, veterinary science, and agriculture. The diplomas of special (secondary) agricultural schools admit to the latter, those of the (secondary) professional schools of the second grade admit to the corresponding schools of university standing.

Besides regular students, there are *uditori* (auditors) who pursue certain courses but cannot become candidates for a degree. No condition is required to matriculate as *uditori.* All courses are open to the public.

No colleges in the English sense exist at any of the universities. There are, however, the *Collegio Ghislieri* at Pavia, where those students belonging to the Lombard provinces who gain scholarships board, and a boarding college annexed to the *Scuola normale superiore* of Pisa.

The school year begins in the middle of October and ends in July. Work begins early in November and ends about the 20th of June.

Degrees. — The faculties of science and letters and the school of pharmacy under the 1906 regulations granted a preliminary degree called *licenza* after two years of study, which was required in order to enter the third year of study, but a recent decree has removed such requirement. After he has passed all special examinations, the student is admitted at the end of the course of study or at any time afterwards to take the examination for the doctor's degree. Such examination consists of (*a*) a written dissertation on a subject chosen by the student; (*b*) an oral discussion of the dissertation and of two out of three subjects chosen by him. A doctor's degree is required not only for the professions (physician, lawyer, teacher in secondary school, etc.) but also to enter the highest grade clerkships in the government service in all branches.

The length of the courses in the various faculties is as follows: —

Law: four years' course leading to the doctor's degree (*dottore in giurisprudenza*); also two special courses of two years each for notaries and attorneys.

Medicine: six years' course leading to the degree of doctor of medicine and surgery. A two years' course for midwives is given at all faculties of medicine.

Sciences: four years' courses leading to the degrees of doctor of pure mathematics, physics, chemistry, and natural sciences. The first two years are prerequisite for schools of engineering. Courses for secondary school teachers.

Belles-Lettres and Philosophy: four years' course leading to the doctor of belles-lettres, and doctor of philosophy (for which courses in the sciences and experimental psychology are obligatory). Special two years' course for elementary school teachers.

Pharmacy: four years' course leading to a diploma of pharmacy, five years' course leading to the degree of doctor of chemistry and pharmacy.

Veterinary Science: four years' course leading to the doctor's degree (*dottore in zooiatria*).

Agriculture: four years' course leading to the degree of doctor of agricultural sciences. Special teachers' diplomas are given to holders of this degree, on completing additional courses at Milan and Portici.

Commerce: three or four years' courses leading to the doctor's degree in sciences applied to commerce. Courses for secondary school teachers.

Engineering: three years beyond the two preparatory years in the faculty of sciences, or at the special school.

The total number of students has grown from 22,515 in 1893–1894 to 27,302 in 1905–1906 or from about 72 per 100,000 inhabitants to over 81. In 1910–1911 the total number of regular students at all universities (Royal and Free) and all schools under the Ministry of Public Instruction (the institute for oriental languages excepted) was 26,372; that of students following only some courses 212. In 1909–1910 these institutions granted 2903 doctor's degrees, 485 engineering diplomas, 494 pharmacist diplomas, and 702 other minor diplomas.

Higher Institutes for Women. — These institutions offer to those who have completed the course in normal schools special four years' courses, at the end of which the students are granted diplomas authorizing them to teach Italian or history and geography or pedagogy and ethics or foreign languages in all secondary schools for girls. The first two years are common to all and include: algebra and geometry, physics, chemistry, natural history and hygiene, history of Italian literature, geography, political history, psychology, logic, and ethics, French language and literature, English or German language and literature, drawing. For the third and fourth year all pupils follow courses of history of Italian literature; political history; French language and literature; German or English language and literature; civics and political economy; history of art; drawing, and other special courses, according to the diploma they wish to take and practice in the subjects of the diplomas.

Besides the two government institutes at Rome and Florence there is a private one in Naples whose diplomas are recognized as equivalent to those of the former.

Special Schools. — The old Chinese college established in 1727 was reorganized in 1888 into a School for Oriental Languages. A general course is now offered in the geography, religion, legislation, and commerce of oriental countries, and special courses in Turkish, Arabic, Chinese, Japanese, Persian, Amharic, Modern Greek, Albanese, English, Russian.

As will be seen, there is no provision for university teaching of theology, fine arts, and music. For the last two some courses at the secondary schools are of a higher grade, and the State offers some scholarships every year to be held at Rome for music, fine arts, and history of ancient and medieval art. At three engineering schools there are courses for architects, but with very few pupils, and studies more scientific than artistic. Bills introduced for the establishment of schools of architecture have failed. The faculties of Catholic theology were suppressed by act of 1873. Such teaching is now carried on at the seminaries, and, in Rome, at some other institutions. For Protestant theology there is a Waldensian school at Florence.

Other Educational Institutions. — Not treated in the foregoing account are: (*a*) *università popolari* (as they do not offer regular courses of study, but only university extension lectures); (*b*) military schools, under the Ministry of War (see MILITARY EDUCATION); (*c*) naval schools, under the Ministry of the Navy (see NAVAL EDUCATION); (*d*) school for officers in the customs service, under the Ministry of Finance; (*e*) postal-telegraph institute under the Ministry of Post and Telegraph; (*f*) school for medal artists (*scuola dell' arte della medaglia*), connected with the Mint; (*g*) reform schools (*riformatori*), under the Ministry of the Interior; (*h*) Italian schools road, under the Ministry of Foreign Affairs; (*i*) courses on agriculture (*cattedre ambulanti d'agricoltura*) and other courses connected with agricultural experiment stations under the Ministry of Agriculture, Industry, and Commerce; (*j*) the school for forest guards at Cittàducale; (*k*) courses on paleography and diplomatics at state archives, under the Ministry of the Interior.

Reform. — Many bills dealing with university reform have been introduced in Parliament, but as for secondary education none has passed. Only those dealing with appointment, transfer, and salary of professors have become acts. In 1912 two bills were presented to Parliament reorganizing the higher schools of commerce, professional schools under the Ministry of Agriculture, etc., and transferring the school of forestry at Vallombrosa, and amalgamating it with the Higher Institute at Florence. A. F.

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IVES, ELI (1779–1861). — Author of textbooks and medical writer, was graduated at Yale College in 1799. He was principal of the Hopkins Grammar School (*q.v.*) at New Haven; one of the organizers of the medical department of Yale College; professor at Yale (1813–1861), and the author of several textbooks and numerous papers on medical subjects. W. S. M.

See YALE UNIVERSITY.

JACKMAN, WILBUR SAMUEL (1855–1907). — Leader in the nature study movement (*q.v.*) and educational writer, was born at Mechanicstown, O. He graduated at the California (Pa.) State Normal School in 1877; studied two years at Alleghany College, and graduated at Harvard University in 1884. He was instructor of science in the Pittsburgh High School from 1884 to 1889, when he was engaged by Francis W. Parker (*q.v.*) to take charge of the science work in the Cook County (now Chicago) Normal School. Here he developed the lines of nature study teaching which became the general practice in elementary schools. In 1899, when the Chicago Institute was organized, he accepted the post of head of the science department; and when this was later merged into the School of Education of the University of Chicago, he became the professor of natural science. He was dean of the College of Education from 1901 to 1904, and principal of the University Elementary School from the latter date until his death. His published works include *Nature Study for Common Schools* (1891), *Number Work in Nature Study* (1893), *Nature Study Record* (1895), *Nature Study for Grammar Grades* (1898), and numerous papers on the place of nature study in education. He was also editor of the *Elementary School Teacher*. W. S. M.

See Nature Study; Parker, Francis W.

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JACKSON, ABNER (1811–1874). — Fourth president of Hobart College, was graduated from Trinity (then Washington) College in 1837. He was tutor and professor at Trinity (1838–1858) and was president of Hobart College (1858–1867). Author of several papers on education. W. S. M.

JACKSON COLLEGE FOR WOMEN. — See Tufts College.

JACKSON, CYRIL (1746–1819). — Dean of Christ Church, Oxford, born in Yorkshire and educated at the Manchester Grammar School and at Westminster School under Dr. Markham (*q.v.*). He entered Christ Church, Oxford, in 1764, graduated B.A. in 1768. After acting as sub-preceptor to the sons of George III under Dr. Markham, he took holy orders. He became Canon of Christ Church in 1779 and Dean in 1783, in which position he attained great popularity with the students in spite of the strict enforcement of discipline He attached importance to the college examinations and encouraged his students to compete for prizes and exhibitions. He assisted in framing the Public Examination Statute at Oxford which was put into practice in 1802; many Christ Church students took high rank in the Oxford examinations. He resigned in 1809. Jackson was a man of great intellectual ability, was considered a good classical scholar, had a knowledge of mathematics, botany, and architecture, and became a Fellow of the Royal Society. Many of his students attained positions of eminence in politics, the chief among them being Sir Robert Peel.

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JACKSON, EDWARD PAYSON (1840–1905). — Author and teacher, born at Erzerum, Turkey; educated at Amherst College; master in the Boston Latin School (1877–1905), and author of several geographical works and numerous scientific articles and monographs. W. S. M.

JACKSON, HERMAN MERILL (1815–1868). — College president and educational author, was graduated from Wesleyan University in 1839. He was professor at St. Charles, Mo., College (1839–1842), Augusta College, Ky. (1842–1844), Ohio Wesleyan University (1844–1850), Dickinson College (1850–1860), and president of Dickinson College (1860–1868). He was author of Latin textbooks and essays on education. W. S. M.

JACKSON, SHELDON (1834–1909). — Missionary educator and organizer of schools in Alaska (*q.v.*), graduated at Union College in 1855 and at the Princeton Theological Seminary in 1858. He engaged in missionary work among the American Indians (1858–1864); served as principal of the Rochester Female Institute (1864–1869); was special agent of the government to select Indian children for the schools at Carlisle and Hampton (*q.v.*), and organized mission schools in the Northwest (1869–1877); organized the educational work of Alaska in 1877, and was superintendent of schools and general agent of education in Alaska (1877–1900). He published the *North Star* at Sitka (1887–1893); organized the Alaskan Society of Natural History and Ethnology (1887), and published numerous reports on education in Alaska. He inaugurated the reindeer service in Alaska in 1892. W. S. M.

See Alaska, Education in.

JACOBI, MARY PUTNAM (1842–1906). — Educational writer and physician, received her professional education in the Philadelphia Woman's Medical College and the École de Médicine of Paris. She was professor in the Woman's Medical College of New York and the New York Post-Graduate Medical School. She wrote *Studies in Primary Education*, *Adolescent Girls*, and numerous papers on educational and medical subjects. W. S. M.

JACOTOT, JEAN JOSEPH (1770–1840). — A French mathematician and teacher, who originated a famous "universal" method in education. In his diversified career he was professor of Latin and Greek literature, subsequently of mathematics, and Roman law; entered the army, eventually rising to rank of captain of artillery; was a member of the Chamber of Deputies; later became lecturer on French language and literature at the University of Louvain, and director of the military school of Belgium. The extremely diversified character of his life and interests undoubtedly led to one of his educational fallacies that "all human beings are equally capable of learning." If this be sound, it forces one to the conclusion that everybody can be proficient in anything to which he turns his attention, in which case there is really little justification for believing in the selective function of the school. Jacotot's educational principles are set forth in paradoxical fashion in his *Enseignement universel* (Louvain, 1822). "Every man can teach, and even teach what he himself does not know." Jacotot's own success in teaching French to Flemish students at the University of Louvain, while he himself did not know a word of the language of his pupils, gave some color to his assertion. He did this by means of books printed in French and Flemish in parallel columns. The fact that his students learned though he did not teach them apparently supported another one of his contentions: "One can instruct himself all alone." *Tout est dans tout* (All is in all) is probably the most familiar of all his paradoxes. The corollary, "Know one thing thoroughly and relate everything else to that," throws considerable light upon the earlier axiom. In other words, no bit of learning exists by itself, but bears a direct relation to a large number of related knowledge fields. In practical application of this axiom, Jacotot took Fénelon's *Télémaque* as a point of departure, requiring that six books of that classic be committed to memory by the pupil. Not only did this, with all the commentaries, immensely broaden the field of the pupil's knowledge, but furthermore the method of work necessary to assimilate this carried over very materially in attacking other problems. His universal method consisted of four steps: (1) learn something as closely related as possible to the subject in hand, but learn it so thoroughly that it will be constantly ready for use; (2) repeat that something unceasingly; (3) reflect upon that work done until it no longer rests upon the surface of the memory mass, so to speak, but until it has sunk down deep and has become a real part of the individual's mental stuff; (4) verify or test other facts, rules, generalizations, etc., and measure them all in terms of what you already know. Concrete applications of this method will be found in each of the authorities cited below. In spite of the vagarious character of his paradoxes, Jacotot's generalizations did contain some germs of truth, but stated in the sweeping form in which he expressed them, they had little practical value. This is particularly true of his notion that whatever became really assimilated was that which the individual had worked out for himself, and not what somebody had told him; and the very broad suggestion of the principle of correlation which is found in his "all in all" axiom. Nevertheless, Jacotot enjoys a far greater reputation in Germany than in his native country, and one which unquestionably overestimates his positive influence upon educational thought and educational practice. His chief works were: *Enseignement universel, Langue maternelle* (Louvain, 1822); *Musique, Dessin et Peinture* (Louvain, 1824); *Mathématiques* (Louvain, 1827); *Langues étrangères* (Louvain, 1828); *Droit et Philosophie panécastiques* (Paris, 1837). See also the *Journal de l'Emancipation intellectuel*, published by his two sons. F. E. F.

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JACQUES, JABEZ ROBERT (1828–1892): — College president, was graduated from Genesee College in 1854; instructor in academies in New York, 1854–1858; professor in Rochester Collegiate Institute, 1862–1865, and Illinois Wesleyan University, 1865–1875; president of Albert College, Canada, 1875–1885, and of Hedding College, Illinois, 1886–1892. Author of *Study of Classical Languages* and sermons on education. W. S. M.

JAHN, FRIEDRICH LUDWIG (1778–1852). — The father of German gymnastics, familiarly known to German gymnasts as *Turnvater Jahn.* He was born in Lanz, Prussia, the son of a country pastor. The first thirteen years of his life were spent at home, where he learned to read the Bible and studied history, geography, and the German language under the direction of his parents. He early manifested keen interest in outdoor life and all sorts of physical activities; he learned to ride and swim and was very fond of walking, climbing, jumping, and running. In 1791 Jahn entered the Gymnasium at Salzwedel, and in 1894 left to enter the Gymnasium zum Grauen Kloster in Berlin. His independent and restless spirit led him into frequent conflicts with teachers and fellow pupils. His university career was varied and stormy. He spent five years in Halle, one year at Greifswald, and brief periods at Göttingen and Jena. In each of these universities he carried on strenuous campaigns of opposition against the student clubs or Lansmannschaften. In 1806 he joined the army and wandered through various German states until July, 1807, when the Treaty of Tilsit was signed.

The next two years were spent in literary work at Jena, and in 1809, Jahn went to Berlin where he taught history, German, and mathematics in the Gymnasium zum Grauen Kloster, the same school from which he had run away fifteen years before. He took the boys to the Hasenheide, on Wednesday and Saturday afternoons, and taught them games, running, jumping, and wrestling. The exercises were so popular with the boys that Jahn continued to teach them indoors during the winter months.

In the spring of 1811 Jahn established the first regular Turnplatz at the Hasenheide, and from this time on the terms *Turnkunst, turnen, Turnhalle* became familiar. This was the real beginning of his life's work, the founding of the great movement for popular gymnastics in Germany. An important feature of the activities was the singing of patriotic songs.

In 1813 Jahn responded to the first call for soldiers in the War of Liberation. He returned to Berlin after the war, and in 1817 received the honorary degree of Doctor of Philosophy from the universities of Jena and Kiel, in recognition of his services to the fatherland in time of need, his stimulating influence on the young, his power as a public speaker, and his efforts in behalf of the German language. As the result of his agitation in favor of German nationality, he was arrested in July, 1819, on suspicion of "secret and most treasonable association." From this time until 1840 Jahn was forbidden to live "in Berlin or within a radius of ten miles from the capital, or in any city containing a university or higher school for boys." This restriction was removed when Frederick William IV ascended to the throne, and Jahn was decorated with the Iron Cross. In his last address delivered about 1848, he closed with these words: "Germany united was the dream of my childhood, the morning glow of my youth, the sunshine of middle life, and it is now the evening star which beckons me to everlasting rest." His declining years were spent in poverty and obscurity, and he died at Freyburg, after a brief illness, Oct. 15, 1852.

Turnvater Jahn is still held in loyal and grateful remembrance, as the apostle of German unity and the man who gave to the German people a love for gymnastics. Monuments have been erected to him in Berlin, Lanz, Freyburg, and other places. Jahn's most important writings are the following: —

Uber die Beförderung des Patriotismus im Preussischen Reiche (Halle, 1800); *Bereicherung des Hochdeutschen Sprachschatzes versucht im Gebiete der Sinnverwandschaft, ein Nachtrag zu Adelung's und eine Nachlese zu Eberhard's Wörterbuch* (Leipzig, 1806); *Deutsches Volksthum* (Lübeck, 1810); *Die Deutsche Turkunst zur Einrichtung der Turnplätze, dargestellt von Friederich Ludwig Jahn und Ernst Eiselen.* (Berlin, 1816.) G. L. M.

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JAMAICA, EDUCATION IN. — Jamaica was seized by the English in 1655, and their possession of the island and the attached Turks and Caicos islands was confirmed by the treaty of Madrid in 1670. The administration is committed to a resident governor appointed by the crown, and a legislative council which is partly formed by election. The population is estimated at 862,000, of whom the blacks constitute 56 per cent and mixed races 18 per cent. The moral and intellectual condition of the people early excited missionary interest; it was not, however, until the nineteenth century that systematic efforts were made for their improvement by religious societies and philanthropists. Between 1820 and 1834 forty schools were established for the instruction of slaves and seven for free people. In the latter year slavery was abolished in the island, and in the following year (1835) Government allowed £50,000 to be used in building schoolhouses. Soon after, the Mico bequest of £1000 which was made 100 years before and had increased in the interim to £110,000, became available for the education of the former slaves. Under the double stimulus of government and private funds, schools for the people multiplied for a time, but the interest declined and for thirty years little progress was made. In 1865 the cause was revived and several measures were adopted by the Legislature, looking to the improvement of the schools. Competitive examinations were ordered for schoolmasters, and in 1867 the grant-in-aid system was introduced after the English plan, and thus the existing elementary schools were brought under a measure of government supervision. Several endowed schools, following the model of the English endowed or grammar school, had also been established for the children of the privileged or ruling class in Jamaica, and in 1879 a special commission was appointed to inquire into the condition of this class of school and to make recommendations for their further conduct. A few years later, 1885, a commission of inquiry was appointed for the entire system of elementary education and as a result, chiefly, of the investigations of that body, a new organization of the work was effected.

In accordance with the recommendations of the commission, the legislative council in 1892 created a central board advisory to the Education Department in respect to elementary education; authorized the levy of a local school tax, and provided for a special grant in lieu of fees for schools remitting the same. The legal age for school attendance was fixed at six to fourteen years of age, and the governor was authorized to enact compulsory attendance laws at his discretion. A second commission appointed in 1898 made a very thorough investigation of the entire educational system, and their recommendations as regards elementary schools, as far as practicable, were embodied in the code of regulations issued by the Education Department in 1900.

The schools are either public, *i.e.* supported and managed by the government, or voluntary (chiefly under denominational management). Both classes of schools share on the same terms in the grant which is distributed on the basis of the results of the annual examinations and the inspector's report as to the general condition of the school, together with the number and qualifications of the teachers. There is no color line in the public schools, but separate schools are allowed where required. White children are generally sent to private schools or are instructed at home by tutors.

For the latest year reported (1909–1910) the number of elementary schools was 693, with an enrollment of 89,902 pupils and an average attendance of 57,849, or 64 per cent of the enrollment. The government grant for the schools amounted to £47,399 ($228,359) equivalent to $3.94 per capita of average attendance. The obligatory program for the elementary schools includes besides the three elementary branches, elementary science as related to agriculture and handicraft. Optional branches for which grants are allowed are Scripture lessons, geography and history, English language, geometric drawing, and singing. Special grants are allowed for drawing and needlework. The government bears part of the expenditure for five industrial schools in which provision is made for orphan or abandoned children. The three training colleges for women were attended by sixty-one students and the single training college for men, by sixty-eight students.

For secondary education there are two schools aided by the government, enrolling in 1910 a total of 133 pupils, and several unassisted, endowed schools. These schools all prepare students for the Cambridge Local Examinations, Senior, Junior, and Preliminary, which are held at seven centers in the Island. University College, founded in 1888 as an extension of the Jamaica High School, prepares students for the London University examinations. A Rhodes scholarship of the value of $1500, tenable for three years, is assigned to Jamaica.

Two noteworthy evidences of progress are dwelt upon in the recent official reports; viz. the multiplication of school gardens, and the excellent condition of the schools in Kingston, the capital city. The number of schools to which school gardens are attached is 361, with an attendance of 24,000 children of an age to benefit by the practical training thus afforded. The sum of $2500 was appropriated in aid of this work in 1910, and four prizes ranging in value from $5 to $20 offered for competition in each of the schools. A special course in agriculture is given at Kingston for the benefit of teachers. Provision has been made at seven centers for advanced manual training, and it is proposed to establish at Kingston a school of technology. The system of elementary education with its special extensions is under the general supervision of the Superintending Inspector, who is assisted by a corps of inspectors, one for each of the seven school districts. The majority of these officials are graduates of English universities. The most urgent need of the system is provision for adequate salaries and a more certain tenure for the teachers.

A. T. S.

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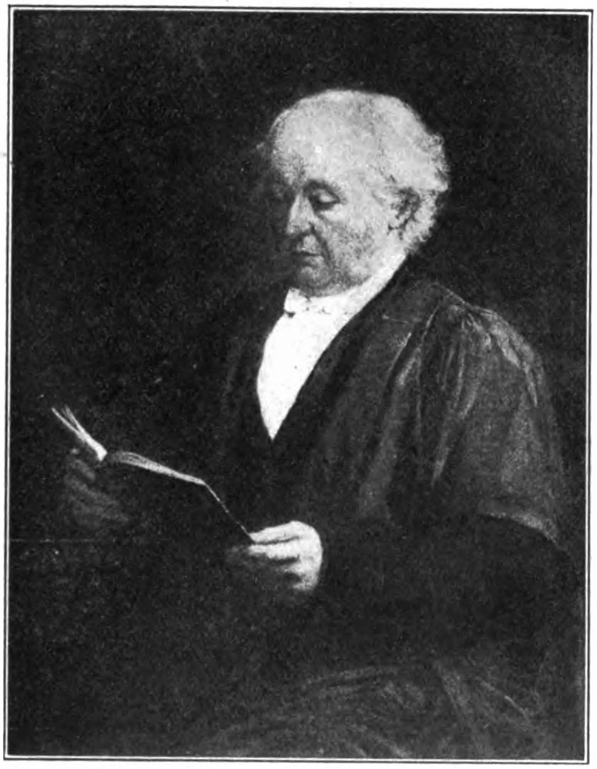
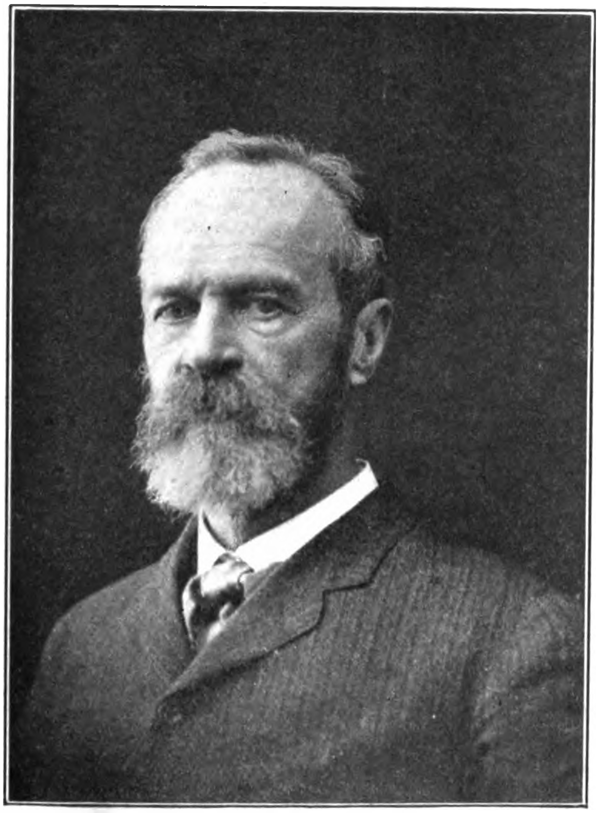
JAMES, WILLIAM (1842–1910.) — Probably the most eminent American philosopher and psychologist, was the son of a theologian. The account of his training and of the development of his career and influence as teacher and author, as psychologist and philosopher, is one of the most romantic known to biography. Owing in part to the foreign residence of his father, and in part to his own varied interests, his higher education extended over a period of ten years. It included a year at the University of Geneva, one year as a student of art under Hunt at Newport, two years in the Lawrence Scientific School, devoted mostly to anatomy and chemistry, two years in the Medical School of Harvard University, a year in Brazil with Agassiz, the naturalist, one year in Berlin, pursuing physiology, and finally a return to Harvard, for further work in zoölogy, where he received the M.D. degree in 1869.

During thirty-five years he was a teacher in this university. After giving instruction in physiology and anatomy seven years, he transferred his work to philosophy for nine years, followed by a nearly equal period as a teacher of psychology. The last decade of active teaching found him again a professor of philosophy. He was brilliant, influential, ever ready to help young minds " find them-



Benjamin Jowett (1817–1893). See p. 570.

William R. Harper (1856–1906). See p. 218.



William James (1842–1910). See p. 516.

Simon S. Laurie (1829–1909). See p. 653.

A GROUP OF MODERN UNIVERSITY EDUCATORS.

selves." He was also a lecturer at Columbia and Oxford Universities. He was one of the founders of the *Psychological Review*, and of the American Psychological Association, of which he was twice president.

A gifted and prolific writer in the fields of psychology, philosophy, and education, he frequently contributed to periodicals and published half a score of books. Among these are: *The Varieties of Religious Experience*, *The Will to Believe*, *Pragmatism*, *A Pluralistic Universe*, and *The Nature of Truth*. His greatest and most influential work, *The Principles of Psychology*, appeared in 1890, and soon became a classic in an unusually literal sense of the word. With the repeated reprintings, and the translations of several of his books into foreign languages, as French, German, Italian, Japanese, Spanish, or Russian, and the extension of his fame, he was signally honored with degrees by seven foreign and American universities, and with membership in the national academies of science in America, Denmark, England, Germany, Italy, and Russia. As a personality, his was a gentle and universal character, marked no less by its modesty and simplicity.

The chief work of James consisted in a reconstruction of psychology by resetting its problems and by exploring old as well as new fields in search of data for their solution. By his rare mastery of English and his keen sense of the concrete in experience he turned the abstract difficulties in the human subjects into vital interests for the public as well as for students in general. He elaborated no closed system of psychology, and organized no school of psychologists. Working with the new and strong tide of the theory of evolution, he respected past achievements as well, bringing together and rendering mutually helpful varied materials from the associational, experimental, pathological, and physiological developments in the science. His characteristic contributions consisted in showing consciousness to be a process, this use of the cerebralistic hypothesis, his explanation of habit, his appeal to instinct; a new theory of emotion (shared with Lange), and the typical analysis of special processes, such as the feeling of relation, self, reasoning, and will.

In his philosophy James made his approach to problems through his psychology, the former being in many respects a direct application of the latter. His devotion to truth in all its apparent forms and his abhorrence of the abstractions of the past led him into anti-intellectualism and empiricism. He stimulated new interest in speculation in terms of behavior and expediency, and actively fostered current pragmatism. "We are acquainted with a thing as soon as we have learned how to behave toward it." His philosophical efforts centered on the nature of man's mind, the knowledge which it fashions, and the basis of religious experience, and encouraged an optimistic attitude toward the experience and the world which man is creating.

Educational theory and practice, particularly in America, are greatly indebted to James. The rising Herbartian movement was met by his contributions derived from a more enlivening, yet less systematic, psychology. What is being done with children in schools to-day, by way of letting the order of subjects and the methods of teaching follow the lead of the native activities and interests, is in part an outcome of his influence. His conception of education and his views of the work of the teacher appeared in the widely read *Talks to Teachers on Psychology and to Students on Life's Ideals*. "Education is the organization of acquired habits of conduct and tendencies to behavior." "The great thing in all education is to make the nervous system our ally instead of our enemy." "No amount of culture would seem capable of modifying a man's general retentiveness." By directing attention to the value of instincts as the equipment for education, by emphasizing the importance of the formation of habits, and by the serious doubt he threw around the doctrine of formal discipline, he fostered a descriptive study of the data of teaching and hastened the coming of experimental pedagogy. E. F. B.

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JAMES-LANGE THEORY. — See Emotions.

JAMES MILLIKIN UNIVERSITY, DECATUR, ILL. — Founded in 1901 by the amalgamation of Lincoln College, Lincoln, and the Decatur College and Industrial School. The institution which is coeducational is under the supervision of the Synods of Indiana, Illinois, and Iowa of the Presbyterian Church. The University includes a preparatory school and the college, which gives courses in liberal arts, engineering, fine arts, domestic economy, music, commerce and finance, pedagogy, and library science. The entrance requirements are fifteen units. The degrees of A.B. and B.S. are conferred. The faculty consists of sixty-four members.

JAMESTOWN COLLEGE, JAMESTOWN, NORTH DAKOTA. — A coeducational institution which was organized in 1883, and gave instruction until the spring of 1893, when instruction was suspended. In 1909 the college was reopened with an enrollment of 102 students.

The enrollment in 1912 was 190. The college is under the auspices of the Presbyterian Church. The plant consists of five buildings, and a campus of 107 acres. There is a permanent endowment of $200,000. It is the only college now operating in the state west of Fargo and Grand Forks, a territory of 140,000 square miles. Courses are offered leading to the degrees of A.B. and B.S., courses in music, in expression, in domestic science, in commercial subjects, and in secondary subjects, as well as regular college courses. Fifteen units in high school are required to enter the college. There is a faculty of sixteen members.

JANES, LEWIS GEORGE (1844–1901). — Educational writer and lecturer, received his school training at the Providence High School and Brown University. He was instructor in Adelphi Academy, president of the Brooklyn Ethical Association, and director of the Greenacre, Me., Summer School of Comparative Religion. Author of *Evolution of Morals*, (1889). *Scope and Principles of Evolution Philosophy* (1890), *Life as a Fine Art* (1891), *Cosmic Philosophy as Related to Ethics* (1895), *Social Ideals and Social Progress* (1899), and of numerous papers on educational, social, and religious subjects. W. S. M.

JANITOR, SCHOOL. — An official who takes care of a school building, *e.g.* sweeps and cleans it, looks after the heating of the building, makes minor repairs, and renders such miscellaneous service to the principal and teachers as may be required. The position is one of importance, and it is capable of becoming much more so than it is as yet, except in a few favored places. Too often the position of janitor in our city schools is filled by rewarding political service, and not infrequently a relatively poor janitor is safe from dismissal, because he is supported by those whom the superintendent of schools does not think it wise to antagonize. It not infrequently happens, too, as a result of this political basis of selection, that the janitor of a school building receives a larger yearly salary than the teachers who teach in it. With some form of civil service tests, and with appointment and dismissal by the business manager for the Board of Education instead of by the Board itself, the position can be made one of much importance in the management of a school system. E. P. C.

See ARCHITECTURE, SCHOOL; BUSINESS MANAGER; CITY SCHOOL ADMINISTRATION; CLEANLINESS OF SCHOOLROOM, ETC.

JANSEN, CORNELIUS. — See PORT ROYALISTS.

JANSENISM AND EDUCATION. — See PORT ROYALISTS.

JANUA LINGUARUM. — "The gates of languages" — a popular name for an introductory text in the classical languages especially during the seventeenth century when Comenius' text by that title became famous. The title had been used previous to Comenius by Habrecht, Batæus, and possibly by others.

See COMENIUS, JOHN AMOS.

JAPAN, EDUCATION IN. — **Historical.** — The present educational system of Japan dates from 1872, when the first education code under the new régime was published. In 1868 took place the great event called *The Restoration of Meiji*, Meiji being the name of the new era then inaugurated. Up to that time, for some seven hundred years, the whole administrative power of the empire had been in the hands of the military class, the head of which under the title of *Sei-I-Tai-Shôgun* (*generalissimo for subjugation of barbarians*) was *de facto* ruler of the country; under him, there were military lords, each having an almost autonomous power in his own territory. In 1868 the *Shôgun* gave up his power into the hands of the Emperor, and in 1871, the feudal system was finally abolished. The military class lost its monopoly of civil and military services and all classes were made equal before the law. The first education code of 1872 established equality of all classes in educational matters and the principle of compulsory education. The preamble to the code says: "It is intended that henceforth universally without any distinction of class or sex, in a village there shall be no house without learning (education), and in a house no individual without learning. Fathers and elder brothers must take note of this intention, and, bringing up their children or younger brothers (or sisters) with warm feeling of love, must not fail to let them acquire learning. As for higher learning, that depends upon the capacity of individuals, but it shall be regarded as a neglect of duty on the part of fathers or elder brothers, should they fail to send young children to primary schools at least without distinction of sex." But before entering upon the description of the present system initiated by the new code, it will not be without interest to touch briefly upon the education in the old feudal days before the new era, for it was chiefly men educated under the old régime, who have been leaders in the evolution of modern Japan.

With the introduction of the Chinese civilization in the seventh and eighth centuries, learning began to be cultivated, and in accordance with provisions of the education section of the famous *Taihô* code issued in 701 A.D. a university was established in the capital for study of classics (or philosophy and history), law, literature, music, calligraphy, and mathematics, all except law being exclusively Chinese; a school was also established in every province: only the children of higher officials were, however, admitted either into the university or to provincial schools. With the rise of the military class and the establishment of feudalism, those fell into decay, and for centuries the only places where people could obtain any teaching were Buddhist temples, even sons of great military chiefs receiving their education there, if at all. It was only towards the end of the seventeenth century, when the country began to enjoy continued order and tranquillity under the Shôgunate of the Tokugawa family, that any regular provisions were made for education. Even then it was chiefly confined to sons of *samurai* or military men, and it was not till some hundred years later that schools began to be established in any number for common people. In fact, higher learning was limited to the *samurai* class, while of the others, including farmers, artisans, and merchants (to name them in the order of the social scale of the time), the large mass was entirely without any education or with only the elements of reading, writing, and arithmetic; while the number of those who acquired any literary culture was small indeed. The education of *samurai* in those days consisted in the study of Chinese classics and of training in military arts; they were taught in schools established by each feudal lord for his retainers, while those who showed any special ability, either in literary studies or military arts, were allowed or sometimes ordered to proceed to study further with noted masters throughout the country. There was an academy in Yedo (now Tokyo), the seat of the Shôgun's government, where noted professors gave lectures on Chinese classics; there were also private academies kept by masters, to which scholars flocked, attracted by their fame. Other studies were also cultivated to a certain extent such as Japanese literature (in contradistinction to the Chinese), mathematics, medicine, etc., and, notably towards the latter part of this period, the Occidental learning through the study of the Dutch language. It is a mistake to suppose that we began to study Western arts and sciences only within the last fifty years, — after the coming of Commodore Perry; there were earnest students, though few, who under great difficulties read such foreign books as were brought into Japan by the Dutch and in several cases translated them into Japanese or sometimes Chinese, which was the language of the learned at the time.

Under the new régime, which began in 1868, education was encouraged from the very beginning. The academy of foreign languages, which had been in existence before, was reopened and enlarged, developing in the course of some ten years into the University of Tokyo, while many new schools were opened. Students were sent abroad; foreign teachers were engaged, among others being an American normal school teacher, who was placed in charge of the newly opened normal school and taught the method of class teaching in primary schools; under his direction were compiled schoolbooks and wall charts entirely after the American model. This school was opened in June, 1872, and in September of the same year the new education code was promulgated, which introduced an entirely new system of education after the Occidental model. The provisions of the new code were too ambitious to be carried out completely at the time. Moreover, they had been copied too closely after a foreign model and some of them were found to be unsuitable for the country. During the forty years which have elapsed since that time, many and great changes have been made; but the fundamental principle enunciated, that everybody without distinction of class or sex shall receive primary education at least and that equal opportunities shall be given to all to receive higher education according to their ability, has always been maintained.

Present System. — *General Outline.* — Education is regarded as one of the most important functions of the state and is placed entirely under the state control; there is a Minister of Education who is a member of the cabinet and is in charge of all administrative matters connected with education. It is to be observed that the educational system of Japan is not determined by laws which have to pass through the two houses of the Imperial Diet and to be sanctioned by the Emperor; but more important matters connected with the educational system are regulated by imperial ordinances, which are issued by the Emperor on the recommendation of the cabinet after being submitted to the Privy Council. These are also submitted by the minister previous to their proposal by him in the cabinet to the High Educational Council, an advisory body composed of presidents of imperial universities, of heads of different colleges and schools, of certain coöpted members, of members representing the Departments of the Interior, of Agriculture and Commerce, of Army, and of Navy, and of members specially appointed for their educational experience and knowledge. There are imperial ordinances relating to primary (or elementary) schools, middle schools, girls' high schools, normal schools, higher schools, special colleges, technical schools, imperial universities, private schools, etc.

General. — Let us begin with a brief outline of the whole educational system as determined by those ordinances. At the base of the whole system is the primary school. Below this, there is the kindergarten, which, however, can scarcely be said to form a part of the national educational system. The primary course is divided into ordinary and higher. The ordinary primary course extends over six years and is compulsory for all children who have completed their sixth year. After finishing the ordinary primary course, a child may go on to the higher primary school with a course extending over two or three years. Supplementary courses may be provided for children who at any stage after the completion of six years' compulsory education cannot proceed further with regular education. In primary schools, boys and girls are usually taught together in the same schools and often in the same classes, especially in the ordinary primary, there being but little difference either in the matter or manner of teaching. But beyond the primary, the education of boys and girls becomes distinct both as regards schools and subjects. After six years of the ordinary primary course, a boy who proposes to pursue higher education will, instead of going on to the higher primary, enter a middle school. A middle school has a course of five years to which may be appended a supplementary course of one year. After passing through the middle school, a boy intending to pursue the university course enters a higher school, having a course or rather courses of three years, preparatory to different colleges or faculties of the imperial universities. This would correspond approximately to the first two years of the college course of American universities. After finishing three years of the higher school course when he is between twenty and twenty-one years of age, supposing him to have passed through all the stages without any interruption, he enters one of the colleges or faculties of the imperial universities, having an undergraduate course of three or four years, after which he may pursue further study as a postgraduate student. Instead, however, of proceeding to the imperial universities, a boy may, after he has finished the middle school, enter at once a special college or a technical special college. This college must be distinguished from the college of an imperial university and is more like an American college in its standard and scope.

It should be mentioned that in all cases the graduation from one school or college is a qualification for entrance into the next higher stage, but in recent years the demand for higher education has increased at such a rate that, notwithstanding the very great and rapid expansion of educational resources (see tables at the end), at almost every stage a competitive examination has to be held for admission, the number of candidates for admission being from twice, thrice, to even in some cases as large as ten times the number of those that can be admitted. After leaving a middle school, a boy may also enter a higher normal school for the training of secondary school teachers, or one of the military and naval schools or the navigation school for training of officers of the merchant marine, etc. After two years of higher primary school (or after two years of middle school) a boy may enter a technical school, *i.e.* a school for the teaching of industrial arts (manufactures, engineering, technical arts), agriculture, commerce, navigation, etc. The length of a course in these schools is generally three years, so that a boy will finish his education on this line at about the same age as the boy who has taken a middle school course will have finished his. There are technical schools of even lower grade than this, to which boys are admitted after finishing the ordinary primary school. There are also technical supplementary schools for those who have finished the ordinary or higher primary course.

A girl's education runs on a similar line as far as it goes. Thus after finishing the ordinary primary school, instead of going on to the higher primary, she may enter a girls' high school. The usual length of the course in a girls' high school is four years but may be five years; a supplementary course of two years may be added. In the girls' high school attached to the female higher normal school in Tokyo, the course is five years, with a supplementary "special" course of three years. There is no provision made either by the central or local government for girls desiring to receive a higher education than the supplementary courses of girls' high schools, except female higher normal schools for the training of female secondary school-teachers; but several colleges have been established by private individuals. Besides high schools, there are also technical schools of various grades, just as for boys.

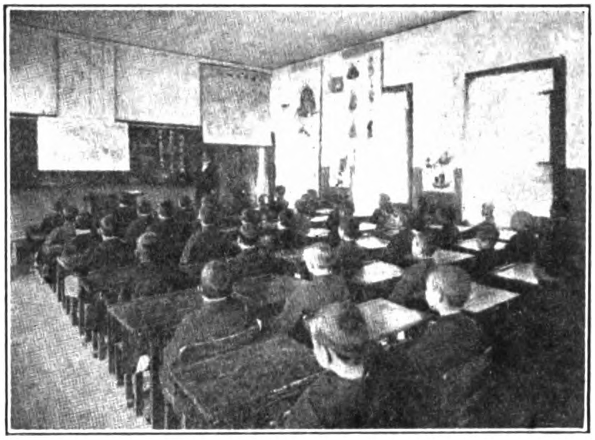
Normal schools for the training of both male and female teachers of primary schools form a separate class by themselves. Their graduates are eligible for admission into the higher normal schools already mentioned equally with the graduates of middle schools and girls' high schools.

There are thus several grades of schools and colleges; first, primary schools with kindergartens and some other schools of the same grade, including some technical schools; next, secondary schools, including middle schools, girls' high schools, technical schools, and normal schools; above them are special colleges for law, medicine, science, literature, fine arts, etc., and technical special colleges for technology, engineering, agriculture and forestry, commerce, etc., besides higher normal schools and higher schools preparatory to the imperial universities; and lastly come the imperial universities with their colleges of law, medicine, science, literature, engineering, and agriculture.

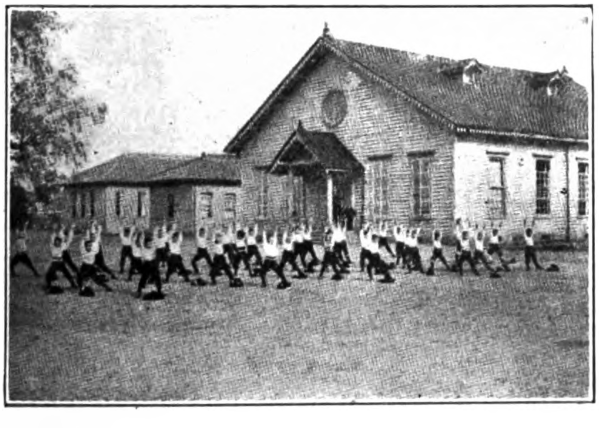
Moral Instruction. — The object of the primary education is defined in the first article of the Imperial Ordinance on Primary Schools as follows: "Primary schools are designed to give children the rudiments of moral education and of civic education, together with such general knowledge and skill as are necessary for life, while due attention is paid to their bodily development." From which it will be seen that great stress is laid on moral instruction; and this is the case, not only in primary schools, but in schools and colleges of all grades and kinds. It is a national tradition that the primary object of education is moral training.

University of Tokyo.

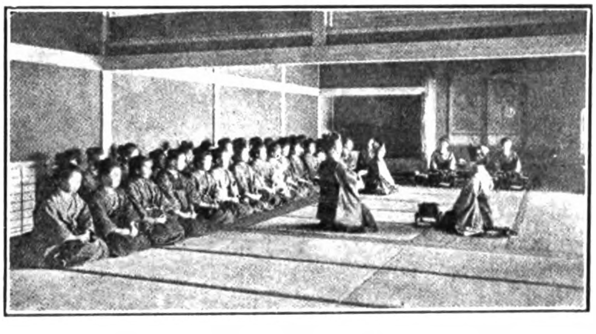
Handwork.



Class Room Recitation.



Gymnastics.



Training in Etiquette. (Tea Ceremony.)

JAPANESE EDUCATION.

Thus in the old feudal days Chinese classics and philosophy were studied by young *samurai*, not so much for literary purposes as for moral training and intellectual culture. They were thereby taught their responsibility as members of the ruling class, and how to discharge this responsibility; there they read of deeds of great and wise men; by such means, through precepts and examples, a spirit of loyalty to their lords and filial piety to their parents, of reverence for the Imperial House and veneration for their ancestors was inculcated. For the lower classes of people conditions were similar, only in a lesser degree; textbooks for popular instruction in reading and writing were chiefly moral lessons. Thus, there was no necessity for special moral instruction in those days; but under the new system with the introduction of so many different subjects, it was found necessary to devote a certain number of hours specially to moral instruction. But here arose a difficulty as to what should be made the basis of the moral teaching. It seemed impossible to return to the old Chinese philosophical teaching; Buddhism (*q.v.*) had been discarded as the national religion; some, while not themselves believing in Christianity, nevertheless thought it might be adopted as the basis of our ethical teaching; there was even some wild talk of a new religion; we seemed to have cut loose from our old moorings and to be drifting, no one could say whither. People seemed to have forgotten that in our old tradition of devotion to the Imperial House and reverence for ancestors, of loyalty and filial piety, we had a most valuable inheritance which has always explicitly or implicitly formed the basis of our moral teaching, even in the days of ascendency of the Chinese influence. But this was now formulated in the memorable Imperial Rescript issued in 1890 by the Emperor. It runs as follows: —

IMPERIAL RESCRIPT ON EDUCATION

Know ye, Our subjects:

Our Imperial Ancestors have founded Our Empire on a basis broad and everlasting, and have deeply and firmly implanted virtue; Our subjects ever united in loyalty and filial piety have from generation to generation illustrated the beauty thereof. This is the glory of the fundamental character of Our Empire, and herein also lies the source of Our Education. Ye, Our Subjects, be filial to your parents, affectionate to your brothers and sisters; as husbands and wives be harmonious, as friends true; bear yourselves in modesty and moderation; extend your benevolence to all; pursue learning and cultivate arts, and thereby develop intellectual faculties and perfect moral powers; furthermore, advance public good and promote common interests; always respect the Constitution and observe the laws; should emergency arise, offer yourself courageously to the State; and thus guard and maintain the prosperity of Our Imperial Throne coeval with heaven and earth. So shall ye not only be Our good and faithful subjects, but render illustrious the best traditions of your forefathers.

The Way here set forth is indeed the teaching bequeathed by Our Imperial Ancestors, to be observed alike by Their Descendants and the subjects, infallible for all ages and true in all places. It is Our wish to lay it to heart in all reverence, in common with you, Our subjects, that we may all attain to the same virtue.

The 30th day of the 10th month of the 23rd year of Meiji. (October 30th, 1890)

Imperial Sign Manual. Imperial Seal.

Such is the Rescript that now forms the basis of our moral education; it will be observed that the two cardinal virtues are loyalty, which with us is identical with patriotism, and filial piety, meaning thereby, not filial piety to our immediate parents only, but to our ancestors for generations. The precepts given are nothing new but "teaching bequeathed by the Imperial Ancestors," and the Emperor calls upon us to join with him in observing those precepts by appealing to our loyalty and filial piety. The message that the Rescript conveys to us cannot be properly understood without the knowledge of the peculiar relation between the Imperial House and the people, and of the spirit of reverence for ancestors; in fact it may be said that the most important object of our moral education consists in so imbuing our children with the spirit of the Rescript that it forms a part of our national life.

A copy of the Rescript is distributed from the Department of Education to every school in the Empire, those under government control being actually signed by the Emperor. To foster the spirit of loyalty, portraits of the Emperor and the Empress are distributed from the imperial household to every government and public schools above the grade of higher primary inclusive, and to some private schools. These are brought out on all public occasions and school functions, at which also the reading of the Rescript always plays an important part.

Two hours a week are given in primary schools to lessons in morals. The following directions as to these lessons are given in the regulations: —

> The teaching of morals must be based on the Imperial Rescript on education, and its aim should be to cultivate the moral nature of children and to guide them in practice of virtues.
>
> In the ordinary primary course, easy precepts appropriate for practice concerning such virtues as filial piety and obedience to elders, affection and friendship, frugality and industry, modesty, courage, etc., should be given, and then some of the duties towards the State and society, with a view to elevate their moral character, strengthen their will, increase their spirit of enterprise, make them value public virtues, and foster the spirit of loyalty and patriotism.
>
> In the higher primary course, the above must be further extended and training given made still more solid.
>
> In the teaching of girls, special stress must be laid on the virtues of chastity and modesty.
>
> Encouragement and admonition should be given by means of wise sayings and proverbs and by tales of good deeds, so that children may lay them to heart.

At present textbooks compiled on these lines by a special commission, appointed in the Department of Education for the purpose, are in use in all the schools.

Similarly for moral lessons in middle schools, to which an hour a week must be given, the following directions are given: —

The teaching of morals must be based on the precepts of the Imperial Rescript. Its object is to foster the growth of moral ideas and sentiments, and to give boys the culture and character necessary for men of middle and higher social standing, and to encourage and promote the practice of virtues. The teaching should begin with an explanation of the essential points of morals in connection with daily life by means of good words or maxims and examples of good deeds, to be followed by a little more systematic exposition of the duties to self, to family, to society, and to the State. Elements of Ethics may also be taught.

For girls' high schools, where two hours a week are devoted to moral lessons, almost the same directions are given, but here in addition lessons must be given in manners, under which are included, not only personal conduct, but various social observances. In other schools, at least an hour a week is given to moral lessons, always based on the Imperial Rescript and on similar lines, but adapted to the age and future position and occupation of pupils; thus, for instance, in commercial schools great stress is laid on various phases of commercial morality.

Physical Education and School Hygiene. — As seen in the article above quoted, defining the object of the primary education, a great deal of attention is paid to the physical development of children. In the old feudal days, sons of *samurais* spent a large portion of their time in practising military arts, such as fencing, archery, riding, use of spears, *jujutsu*, etc., which of course was an excellent physical training; as for children of other classes, their plays and games and even work in open air with but little school teaching kept them healthy and strong; while it was deemed unwomanly for girls, especially in the middle and higher classes, to take any kind of active exercises. Hence when the new education was first introduced, no need of physical education as such was considered, and while boys and girls, young men and women were subjected to much harder mental work than before, they had scarcely any physical exercise. The consequences soon made themselves apparent on the physique of educated youths, and weak sight and pale consumptive features came to be regarded as characteristic of students. Such a state of things could not be allowed to go on; a teacher of gymnastics was engaged from America, who trained teachers of gymnastics, and by this means a system of gymnastics after the German model was introduced into all the schools. Various modifications have since been made in the method of teaching: very young children in primary schools are now taught plays and games, while older boys in primary and all higher schools practice military gymnastics and drill in addition to common gymnastics. In girls' schools, square dances are taught as exercises, and the Swedish system of gymnastics has been introduced to some extent. Besides systematic teaching in gymnastics, foreign games and sports have been introduced: baseball is now a very popular game, and there are lawn tennis courts in almost every school, while boating and athletic sports have their votaries. At the same time old military arts have been revived as physical exercise, especially fencing and *jujutsu*, which in some schools are made almost compulsory, and, in a less degree, archery. Schools of every grade have their annual or semi-annual school excursions (*q.v.*), which, while undertaken primarily for the purpose of instruction in geography, history and science, afford a great deal of training in long-distance walking and marching, hill climbing, etc.

Medical examination of school children is made by medical officers in April of every year under the following heads: (1) height; (2) weight; (3) circumference round the chest; (4) the spine (scoliosis and kyphosis, *q.v.*); (5) general constitution, whether strong, medium, or weak; (6) eyesight; (7) diseases of the eye; (8) hearing; (9) diseases of the ear; (10) teeth; (11) diseases in general, especially scrofula, insufficient nourishment, anæmia, *kakke* or *beri-beri*, consumption, megrim, epistaxis, neurasthenia, and chronic diseases. The results of the examination of over one million school children are sent to the Department of Education, where they are collated and examined. It is too early to draw any definite conclusions from these statistics, but there seems to be no doubt that there has been a very remarkable improvement in the physique of our young men and women.

Primary Schools. — Parents and guardians are under obligation to send children to school, from the beginning of the first school year (April 1) after they have completed their sixth year until they have finished the ordinary primary course, unless they are specially exempted by the mayor or headman of the district on account of mental or bodily infirmities or extreme poverty or for some other valid reason. Hence, an obligation is also laid on the community to establish and maintain a sufficient number of primary schools to accommodate children within its jurisdiction, tuition being, of course, free; the community may be a city, a town, a village, or a union or a division of the same, as the case may be. Special permission must be obtained from the mayor or headman to pursue education at home or at any other school than that established by the community; as a matter of fact, this happens very seldom except in Tokyo, so that practically all children in Japan receive their primary education in common schools without any social distinction. In Tokyo the upper classes are beginning to complain that by sending their children to the same schools as those of the lower classes they suffer in their manners and speech, and also in their intellectual progress, and a few private schools for children of the rich have been started within recent years.

Curriculum. — The subjects taught in primary schools are, besides morals and gymnastics already mentioned, language (reading, writing, and composition), arithmetic, geography, and Japanese history, science (or nature study), drawing, singing, sewing (for girls only), and manual work, making all together from twenty-one to thirty hours a week. It should, however, be mentioned that an hour means usually a forty-five minutes' lesson (or even less), followed by fifteen minutes' play. In higher primary schools the subjects are mostly a continuation of the same, except that elements of agriculture or commercial knowledge and the English language are usually added. As to language, Japanese children are very much handicapped by the fact that they have to learn a large number, some 1500, of Chinese characters in common use in Japan. In arithmetic, almost all our weights and measures being in decimal system, it is not necessary to introduce fractions very early, in fact not until the last, or sixth year, of the ordinary primary. Sewing forms a very important subject for girls, not only in primary schools, but throughout their school course.

Teachers. — Primary school teachers must have certificates or licenses, which are granted to graduates of normal schools and of certain other prescribed schools and to those who have passed the examination held annually in each prefecture, the standard of which is the same as for graduation from normal schools. The normal schools are maintained by the prefectures for the training of primary school teachers and have a four years' course, and, in some cases, a preparatory course of one year. The qualifications for entrance into the preparatory course are that candidates shall be of good moral character and sound constitution and shall have finished two years of the higher primary course. The last, or fourth year, of the normal school course is largely devoted to practice in teaching in the primary school attached to every normal school. A graduate of a middle school or a girls' high school may enter a normal school for one year, during which he or she studies the theory and practice of pedagogy, and becomes qualified as a primary school teacher. It will be seen from the above that the qualifications for primary school teachers are not very high; yet so great has been the educational expansion that the supply of teachers has not kept pace with the demand, and many not properly qualified teachers have to be employed. It may be remarked that this is the case not only in primary education, but in every grade and kind of education in Japan. The salaries of teachers, from university professors to primary school teachers, are very inadequate; this, no doubt, is one of the reasons why the supply of teachers is not sufficient to meet the demand. More than half of the primary school teachers have salaries ranging between 15 and 24 yen ($7.50 to $12) a month, which, even allowing for the low rate of living in Japan, is very inadequate; the highest salary for a university professor is about 4000 yen ($2000). All teachers in government or public schools and colleges are entitled to a pension equal to one fourth the amount of their salary at the time of retirement, if they retire after fifteen years of service, and to "additional $\frac{1}{240}$th the amount of their salary for every year exceeding fifteen."

Middle and Higher Schools. — *Curriculum.* — The subjects taught in middle schools are morals, the (Japanese) language, and Chinese literature, a foreign language (one of the three, English, French, and German), history, geography, mathematics, natural sciences, physics and chemistry, law and economics, drawing, singing, and gymnastics, of which law and economics and singing may be omitted. None of those call for special remark, except "the language and Chinese literature." One who is not acquainted with our language may well wonder why Japanese language and Chinese literature should be coupled as one subject in this way, but the fact is that with the introduction of Chinese civilization we not only adopted Chinese literature almost as our own and introduced very many Chinese words into our own language, but even adopted Chinese characters into our writing, so that at present ordinary Japanese literature is written or printed with Chinese characters, amongst which our own are interspersed. It would take too long to explain this anomalous state so as to be intelligible to a foreign public, but it is a very great handicap indeed, not only for our boys and girls, who have to learn three or four thousand Chinese characters, but also for the general public, for it prevents the use of typewriters, linotypes, and similar instruments based on the use of a limited number of characters.

Teachers. — Teachers in secondary schools are required to have a certificate, granted by the Department of Education to the graduates of higher normal schools and of certain other institutions, as for instance colleges of science and of literature of the Imperial universities, and to those who have passed examinations held annually by the department for the purpose. As already stated, however, a large number of teachers without certificates have to be employed for want of certificated teachers. The tables appended below will show that there has been a steady improvement in this respect.

Higher Schools. — The question of secondary schools is a very difficult problem in every country; even in Germany, which may be said to be a leading authority in every educational question, this problem seems to be still a matter of discussion. In Japan the problem presents serious difficulties. The present middle school course is not sufficient as a preparation for Imperial universities, not only because the standard in the universities is high, but also because to pursue higher studies of this standard in Japan at present requires a knowledge of two or at least one of the occidental languages, so entirely different in their structure and nature from the Japanese language, and presenting corresponding difficulties to Japanese students, far greater than French or German to an American. This chasm between middle schools and universities is bridged over at present by " higher " schools, having three different courses of three years preparatory to different colleges of the universities. Thus the normal age of a student when he is ready to enter an Imperial university is above twenty; it will be seen that the higher school courses correspond both in their standard and the normal age of students somewhat to the first two years of the college course of American universities. There are at present eight higher schools, capable of admitting about 2000 new pupils annually, and as there are between 7000 and 8000 applicants for admission (graduates of middle schools and thereby duly qualified), higher schools and consequently universities obtain a number of tolerably select students. At the same time, however, the voice of discontent of the nonadmitted is loud, and, indeed, it is a great problem what to do with them; many of them enter private, so-called universities, of which mention will be made later.

At a session of the High Educational Council, held in the spring of 1910, it was decided that higher schools should be replaced by higher middle schools having two courses of two years and a term, not simply preparatory to the universities, but giving a higher general liberal education, one of the courses being literary and the other scientific; it is thought that the graduates will be qualified to enter Imperial universities at the same time that they receive general liberal culture. Permission will be given to prefectures and private individuals to open higher middle schools, and several will no doubt be established within a few years, so that the present state of congestion at the entrance of higher schools will be avoided. This decision in a modified form was approved by the late minister of education; the only question is whether in two years and a term, instead of three years, as heretofore, students will be so prepared as to satisfy university authorities.

Imperial Universities. — These institutions are established and maintained by the central government. There are at present four, one in Tokyo (f. 1868) and one in Kyoto (f. 1897), one in the Northwest and one in Kyûshû in course of organization. Each university consists of several colleges or faculties, six in Tokyo, viz. colleges of law, medicine, engineering, literature, science, and agriculture, and four in Kyoto, viz. colleges of law, medicine, literature, and science and engineering; the Northwestern University has at present colleges of science and of agriculture; and the Kyûshû University those of medicine and engineering. Those colleges are like professional schools of American universities, except those of science and literature, which would correspond approximately to the last two years of the American college course and a little more. In each college, there are prescribed courses, which may be taken up by students: in Tokyo, in the college of law, there are courses of four years in law proper, politics, political economy, and commerce; in the college of medicine, besides a course of four years in medicine, there is a course of three years in pharmacy; in the college of engineering, there are courses of three years in civil engineering, mechanical engineering, naval architecture, technology of arms, electrical engineering, architecture, applied chemistry, technology of explosives, mining, and metallurgy; in the college of literature, courses of three years in philosophy, history, and literature, each of them being subdivided into several branches, such for instance as Japanese, Chinese, English, French, and German literatures at the last; in the college of science, courses of three years in mathematics, astronomy, theoretical and experimental physics, chemistry, zoölogy, botany, geology, and mineralogy; in the college of agriculture, courses also of three years in agriculture, agricultural chemistry, forestry, and veterinary medicine. In Kyoto there are similar courses. A hospital is attached to the college of medicine for the purpose of clinical instruction. After graduation, students may remain in the university as postgraduate students. Tuition fees, inclusive of everything, amount to 50 yen ($25). The enrollment at Tokyo in 1909–1910 was 5649, at Kyoto 1424.

Special Colleges. — Under the nomenclature of special colleges are classed institutions for the instruction of special subjects, other than the Imperial universities, whose entrance qualification is graduation from middle schools or girls' high schools, or higher. There are special colleges for law, medicine, literature, languages, sciences, arts, music, etc. There are five colleges of medicine maintained by the central government and several established by the local government or private individuals; these medical colleges all have a course of four years, but their standard is necessarily lower than that of the Imperial universities, students not being so well prepared, especially in foreign languages. Many of the private institutions teaching law, literature, and theology (Buddhist or Christian), and styling themselves universities, are officially classed under this head; among these, the most noted are the Kei-O-Gijuku founded by the famous educationalist Fukuzawa, and Waseda Daigaku founded by Count Okuma, with faculties of law and literature, and the Joshi Daigaku (Women's University). Some of them have a large number of students, but most of them are suffering from want of funds; for, with very few exceptions, they have scarcely any endowment, nor can they charge high tuition fees. Among other special colleges may be mentioned Foreign Languages School, Academy of Fine Arts, and Academy of

Music, all in Tokyo and maintained by the central government. There are, besides those, technical special colleges, of which, however, I shall speak under the next head. The College of Navigation, for the training of officers of merchant marine under the Department of Communications, and the College of Fisheries and Marine Products, under the Department of Agriculture and Commerce, also fall under this category.

Technical Schools. — A great deal of attention has been paid to technical education, more especially within the last fifteen years, and a large number of new technical schools has been recently brought into existence, and old ones have been enlarged both in scope and accommodation. By technical education is meant education in engineering and technology; industrial arts; agriculture in all its branches, including sericulture and veterinary medicine, forestry, fisheries and marine products; navigation, and commerce. There are several grades of schools; leaving out the engineering and agricultural colleges of the Imperial universities, there are immediately below them technical special colleges, admitting graduates of middle schools and having a course of three or four years; below these are technical schools of two classes, *A* and *B*. Schools of class *A* are of about the same standing as middle schools, admitting boys or girls who have finished two years of the higher primary, or under certain conditions two years of a middle school or a girls' high school; they have generally a course of three years, sometimes four, and their graduates are under certain conditions admitted to technical special colleges. Schools of class *B* admit boys or girls who have finished the ordinary primary, and usually have a course of three years. In addition to these there are technical supplementary schools for giving general and elementary technical knowledge to those who cannot enter regular schools; they are mostly night schools.

Technical special colleges are mostly government institutions, among which are the engineering or technological colleges of Tokyo, Osaka, Kyoto, Nagoya, Kumamoto, Sendai, Yamagata and Akita; the commercial colleges of Tokyo, Kobe, and Yamaguchi, Nagasaki and Otaru; and the agricultural college of Morioka. There are several institutions attached to these, to train teachers for technical schools of class *A*, want of good teachers being a great hindrance to their establishment, which is greatly encouraged by the government. A sum of 350,000 yen ($175,000) was voted by the Diet as subsidy for the encouragement of technical education for the year 1908, this sum being distributed to the schools and colleges established by the local governments.

Female Education. — In the old feudal days a girl's education generally stopped at an elementary stage, even for daughters of *samurai*. They were taught to read and write, and to sew, while those of richer classes were also taught many accomplishments, such as music and dancing, *chanoyu* (tea ceremony), flower arrangement, etc. There were some, especially among the *samuari* class, who received much higher literary culture, but they were only a small minority. Under the new régime, female education received great encouragement. The preamble to the first education code already quoted is emphatic on the point that no distinction shall be made as to sex at least in primary education. A girls' school was opened in 1871 with an American teacher to teach English; in the following year a female normal school was opened by the Empress herself, an event without precedent in the history of Japan. But notwithstanding the encouragement given to the female education by the government, it is only quite recently that people in general have begun to recognize its importance. In 1873, a year after the promulgation of the code, out of a total of 1,145,800 attending primary schools, 77 per cent were boys and only 23 per cent girls; in 1883 the total had increased to 3,238,000, but the ratio of boys to girls was 68 to 32; statistics for 1893 show no great advance either in the total number (3,338,000) or in the ratio of boys to girls (66 to 34), but in 1908 the total had increased to 5,996,000, showing an enormous stride made in primary education since the China War of 1893–1894, and the ratio of boys to girls shows the same satisfactory progress, being 57 to 43. In secondary education, the same thing is to be observed; in 1883 there were only 7 girls' high schools with 350 pupils, besides a few schools of about the same standing but not quite satisfying the requirements of a high school; in 1893 the number had increased to 28 with 3020 pupils. The official report for 1908 gives 159 schools with 46,580 pupils, and the number seems to be increasing at the rate of more than 20 a year.

The course in a girls' high school is mostly four years; the subjects taught are morals, the (Japanese) language, a foreign language, history, geography, mathematics, science, drawing, household matters, sewing, music, and gymnastics. The standard is not quite as high as in middle schools. The foreign language may be either French or English; actually there is no school, except the "Peeresses School," where French is taught. A general supplementary course of two or three years may be added for those who, having finished the regular course, desire to receive a further education; these correspond somewhat to the college courses, but they are not very largely attended, girls staying at home to learn sewing and housekeeping with their mothers, or receiving private lessons in music, *chanoyu*, and other accomplishments.

A girl who has finished the girls' high school may enter a female normal school for two years and become qualified as a primary teacher, or she may enter one of the two higher female normal schools and pass a four years' course, when she becomes qualified as a secondary teacher. There are also a few private colleges where girls may receive education in literature, languages, etc. There is at present no means by which a girl may enter one of the Imperial universities. There are also technical schools for girls of different grades as for boys, although not so many; subjects taught in them are sewing, household matters, embroidery, artificial flower making, sericulture, filature, etc.

Statistics. — The statistics which are appended here to give some idea of the extent and progress of education in Japan are compiled from materials given in the Reports of the Department of Education, mostly from that for the year 1908–1909.

GENERAL VIEW OF SCHOOLS AND COLLEGES

	No. of Schools	No. of Teachers	No. of Pupils
Primary schools	26,386	134,337	5,996,139
Blind and deaf-mute schools	40	221	1,802
Normal schools	75	1,307	21,618
Higher normal schools .	2	120	980
Female higher normal schools	1	45	365
Temporary training school (for secondary school teachers)	2	18	56
Middle schools	296	5,719	115,038
Girls' high schools . . .	159	2,395	46,582
Higher schools	8	303	5,435
Imperial universities . .	3	553	7,517
Special colleges	54	1,765	37,432
Technical special colleges .	13	475	6,114
Technical schools of classes A and B . . .	403	3,627	56,573
Technical supplementary schools	4,751	2,049	192,331
Technical school teachers' training schools . . .	3		151
Schools not classed . . .	2,180	7,944	148,971
Total	34,376	160,878	6,627,104

PERCENTAGE OF SCHOOL ATTENDANCE

	1893	1900	1902	1904	1906	1908
Boys	74.8	90.6	95.8	97.2	98.2	98.7
Girls	40.6	71.9	87.0	91.5	94.8	96.9
Average . . .	58.7	81.7	91.6	94.4	96.3	97.8

MIDDLE SCHOOLS

Number of	1896	1900	1904	1908
Schools	99	193	253	288
Teachers with certificates	1,005	2,137	2,934	4,222
Teachers without certificates	692	1,568	1,830	1,385
Foreign teachers . .	12	21	53	67
Pupils	40,577	77,994	100,853	114,395
Graduates	1,798	7,747	14,216	14,950

GIRLS' HIGH SCHOOLS

Number of	1896	1900	1904	1908
Schools	18	51	94	158
Teachers with certificates, men	42	76	279	704
Teachers with certificates, women . .	68	178	521	857
Teachers without certificates, men . . .	68	144	235	260
Teachers without certificates, women . .	40	241	403	545
Foreign teachers, men .	—	—	1	1
Foreign teachers, women	—	—	3	5
Pupils	3,798	11,678	28,191	46,229
Graduates	417	2,469	6,825	10,191

TECHNICAL SCHOOLS

Number of	Schools	Pupils	Graduates
Technological schools of class A	32	4,577	1,056
Apprentices school (class B) . .	81	6,799	1,709
Agricultural schools of class A .	77	12,595	3,459
Agricultural schools of class B .	103	8,257	2,143
Fisheries and marine products schools	14	1,084	215
Commercial schools of class A .	60	18,247	2,648
Commercial schools of class B .	18	2,810	774
Navigation schools of class A .	12	2,027	202
Supplementary schools:			
Technological	251	14,395	4,083
Agricultural	4,185	159,092	33,325
Fisheries and marine products	97	3,757	872
Commercial	215	14,582	3,712
Navigation	2	47	8
Grand total for 1908 . .	5,147	248,269	54,206
Grand total for 1904 . .	1,942	110,609	20,523
Grand total for 1900 . .	285	25,725	4,655
Grand total for 1896 . .	59	7,604	1,168

N.B. Slight discrepancies in the above tables are due to various facts; as, for example, in one table a branch school is counted independently and in the other not, and so on; they are not such as are significant. D. K.

Korea, Education in. — Korea (Morning Splendor), since 1910 part of the Empire of Japan, is a peninsula covering with its archipelago 85,000 square miles, with a population of 12,934,282, in 11 provinces, 317 districts and 4362 villages. Roughly speaking, it consists of an eastern mountain ridge fronting precipitously the nearly tideless sea of Japan, and a long western slope which faces China and a sea containing many islands and with tides rising over thirty feet. Thus, in history and geography, Korea has had her back to Japan and her face to China, the former being in her traditions the land of savages and pirates, the latter the sun and sum of all power and culture. In popular legend the founder of Korean civilization is Kija (Ki-tsze), ancestor of Confucius, who in 1122 B.C., with five thousand followers settled east of the Yalu river. Critical scholarship, however, knows nothing of Kija's presence within the limits of modern Korea. As with the Japanese, the Korean historiographers, when, nearly two thousand years later, first practicing their art, followed in imitation and rivalry their only model, the Chinese, carrying back antiquity as far as possible and ascribing their national beginnings to a great name and looming personality. The foundations of all early Korean historiography, like the Japanese, lie in the annals of China, whence writing was derived. Among the tribes of the peninsula, three states (A.D. 9–960) arose, in the north, east, and west, into which Chinese letters and culture filtered; but it was the entrance of Buddhism, 384 A.D., which, destined to a thousand years of activity, opened the literary, artistic, educational, and intellectual history of Korea. The state predominant in the Middle Ages was Silla (Shinra), whence students traveled to China in ships guided by the mariner's compass, and returning greatly extended the knowledge of Chinese ethics, letters, and philosophy. From A.D. 960 to 1392, under the name of Korai (whence Korea), the peninsular peoples were united and became for the first time a nation, uniform in language, law, religion, and social customs. After several centuries of clash and rivalry between the two systems, Confucianism won the day over Buddhism, at the fall of the old Korai dynasty and the establishment of that ruling from 1392 to 1910, since which time the Chinese system has been the monopoly of the privileged classes, scholars, and office holders. Korean Buddhism, exiled, in its outward manifestations at least, to the mountain monasteries, and held to mainly by the women of the common people, had not those doctrinal developments so noteworthy in Japan. The basis of all education was the Chinese classics.

The method was for the schoolmaster to have, squatting before him, a dozen or more boy pupils, who first committed to memory, through the eye and ear — usually bawling out the sounds at the top of their voices — the characters in order of their composition in the text, and then to " back the book " and recite. Then, by analysis and syntax, reading was made thorough. After that came comment and explanation. The brush-pen was in constant use for both ordinary and rapid writing, and calligraphy was greatly prized. Except some slight knowledge of (Chinese) history and arithmetic, this curriculum comprised the average educated man's training, though a minority went on farther, in reading and mastery of the world of Chinese lore — poetry, philosophy, commentary, and discussion, — or excelled in mastery of the brush-pen in calligraphy. Thousands of Koreans can write and decipher numerous ideographs, who cannot read books. In the native newspapers of to-day, read by many of the common people and women, the Chinese logograms are plentifully used, but require no knowledge of Chinese syntax; the mixed script, native and Chinese, being read in the same way as we read our Arabic numerals, terms in Latin letters, and words of Greek origin, as familiar parts of speech. Korea's greatest scholar, Chul-chong in the Silla era, or eighth century, invented or adapted from selected Chinese characters the Nido, or syllabary, which admirably expresses vernacular sounds. Later on, a true phonetic alphabet, based on the organs of speech and one of the finest of the world, of eleven vowels and fourteen consonants, made of straight lines and circles, called En-mun, was invented by a Korean statesman. The two systems exist side by side. The letters, being associated in all their possible combinations into syllables, 199 in all, are learned, without analysis or separation, by children by rote. In this popular script personal letters are written, and the novels read by women and young people are printed. Being so very easy to learn, and because made the vehicle of the vulgar fiction, the En-mun was despised by scholars. For centuries it lay virtually unused by the learned, until the advent of the missionaries, who to their delight found ready to hand the apparatus of education and evangelism, of which they at once made liberal use. Three or four styles of language still prevail, as in Japan: (1) pure Chinese; (2) Chinese vocabulary set in native syntax; (3) popular book style, vernacular but refined; (4) epistolary style.

The end and aim of all formal education in old Korea was political office. Society had but two classes, the yang-ban (civil and military), office seekers and holders, and the masses or commoners, given up to ignorance and superstition, there being virtually no middle class. The whole outlook on the universe and the world of aims and ideas were changed with the coming of the missionaries in 1885, the first being Horace N. Allen, who, in 1885, founded a hospital under royal patronage. He was soon followed by other physicians, and the natives were given valuable training in the laws of cause and effect. The first teacher and educator was Henry G. Appenzeller, who in 1885 opened a school and began the teaching of the English language and sciences. His school in 1886 was noticed by the king himself, who gave it the name of Hall for the Rearing of Useful Men. About the same time. Mrs. W. B. Scranton opened a school for Korean girls, both being soon housed in brick buildings. A government medical school was started by Dr. Horace G. Underwood, Dr. J. W. Heron, and Dr. H. N. Allen, and two American lady physicians served the Queen. Three American teachers, requested by the Korean government, Messrs. Gilmore, Bunker, and Hulbert, arrived in July, 1886, and opened an English language school. From this time forward the native language was seriously studied by foreign scholars, and many writers visited the country and by their writings made Korea better known. Schools for the study of German and French, and other English language schools were established by Europeans. The results of the Chino-Japanese war of 1904–1905 completely altered the intellectual attitude of the Koreans toward China, and they turned to the missionaries for light. As early as 1906, under the energetic administration of Prince Ito, the Japanese themselves, having had already over a generation of experience, established modern common schools and reorganized the normal, high, and foreign language schools in Seoul. So far the system is a model, rather than an advanced development. As a rule, the number of native teachers compared with Japanese is as two to one. To encourage female education, a girls' high school was established in 1908 to serve as a model, while girls in separate classes were admitted to the public schools. In 1909 the regulations for establishing industrial schools and increasing the curriculum of agriculture, commerce, and industry in the higher schools already in operation, were issued. In December, 1909, 512 Korean, 163 Japanese, and four foreign teachers (679) were serving in 134 schools maintained or appointed by the government, in which were 811 female and 15,445 male students, the usual number in a class being sixty. Only the limitations of finance and the lack of skilled teachers prevent rapid growth. In new places the school established is meant to serve as a model; $82,700 for all schools were estimated in the budget for 1909. In the normal schools manual training was made compulsory, the classes to number fifty each. Increase of public interest is shown in the 2250 applications made to enter the Seoul Normal School, 194 passing the examination successfully, the number of students in 1908 being 140, and 212 in 1909. For high schools the regulations of 1909 shorten the period of study from four to three years, according to local conditions. The number of applicants far exceeds those who pass the entrance examinations. In 1909 25 teachers taught 269 students, and there were 35 graduates. In the girls' high school, in which 7 teachers taught 151 girls, sewing is compulsory and artificial flower making, optional. In the foreign language school in December, 1909, Japanese, English, French, German, and Chinese were taught. Of 1130 applicants, 307 passed, 38 teachers taught 443 pupils, and the graduates numbered 106. To the old Chinese Classical School modern historical and scientific subjects were added. In the Law School 19 instructors had 138 students under them. In 1909 the seven industrial schools, classified as agricultural, commercial, technical, and supplementary industrial, in which most of the practical branches of learning are taught — the foundries, farms, experimental stations, forestry schools being equipped according to the best science — had 42 teachers and 306 pupils. Of private, which include missionary, schools, by December, 1909, 2180 had received government recognition, and of those duly inspected or instructed, there are two high, two industrial, 1353 miscellaneous, and 829 missionary schools, or 2187 in all. Textbooks must be supervised or approved by the government, and are lent to the pupils, to be gradually paid for. In 1909 202,936 books were sold and 159,314 lent, the number being nearly six times that of 1908. By competitive examination, fifty-two students were selected and sent to Japan for higher study.

Translation of the Bible into Korean printed with mixed script or En-mun, and its rapid distribution by energetic Bible societies, following upon widespread propaganda and revivals (which have resulted in a total Christian population of 250,000), marked not only with fervor, but with habitual study of the Scriptures, compelled many to learn the alphabet to master a sacred library so rich in substance and novelty, have constituted a national school of intelligence and culture. This is especially noticeable in Seoul and Ping Yang.

In spite of the handicap to education which the hereditary hatred of Koreans to their conquerors, the survival of sedition, the prevalence of early marriages the brides being usually older than the grooms — the age — old prejudice against manual labor by the intellectual classes, education promises to be universally appreciated the Koreans having an innate love of letters and respect for scholarship. W. E. G.

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JASSY, UNIVERSITY OF. — See Roumania, Education in.

JAVA, EDUCATION IN. — See Netherlands, Colonies of, Education in the.

JEALOUSY. — A complex emotion which always involves some feeling of self-consciousness on the part of the jealous individual. The rights or desires of the jealous individual are in some way felt to be invaded, whereupon the individual is aroused to anger and the tendency to assert his own rights, either real or fancied. McDougall (*Social Psychology*, p. 138) reduces the emotion of jealousy to the fundamental instinct of possession or ownership, and holds that the earlier forms of jealousy which appear in animals and young children are primarily forms of anger or fear. The emotion has also been described by Ribot (*Psychology of Emotions*), who quoted with approval Descartes' definition: " Jealousy is a kind of fear related to the desire we have of keeping some possession."

Whatever may be said of the psychological character of this emotion, it is a matter of common experience that it is one of the earliest forms of social experience. Certainly the consciousness which is involved need not be of any very elaborate type. The child becomes aware of his own desires and possessions by the fact that some one else arouses in him the anger which follows upon the invasion of his rights and possessions. Jealousy may, therefore, be regarded as the first emotional expression of the growing feeling of self-importance.

As in the case of the other emotions, so in the experience of jealousy, there is no very clear intellectual apprehension of the relations that are involved. As soon as one comes to recognize clearly his rights and those of others, the tendency is for the emotion to give away, and for a fuller form of intellectual experience to arise. C. H. J.

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JEANES, ANNA T., FOUNDATION. — An organization consisting of a board of trustees formed in 1908 for the purpose of administering the sum of $1,000,000 left by Miss Anna T. Jeanes of Philadelphia for improving negro rural education. The aim of the board is to encourage and coöperate with established educational authorities without attempting to relieve them of the burden of responsibility. Thus the foundation steps in to point the way. At present its work lies in three directions: (1) the appointment of teachers to introduce and supervise industrial education (Henrico plan); (2) the appointment of teachers to do extension work among a number of schools and to act as supervisor; (3) the appointment of a county agent to improve the homes and the schools and to create a public sentiment for better schools; he also acts as a supervisor of schools. President Dr. James H. Dillard of Tulane University is general agent of the Foundation.

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JEBB, JOHN (1736–1786). — Theologian, doctor, and university reformer, born at Cashel, Ireland; studied at Trinity College, Dublin, and Peterhouse, Cambridge, where he graduated B.A. in 1757, being second wrangler. He took holy orders in 1762, and continued at Cambridge as lecturer in mathematics and Greek Testament. In the history of Cambridge University (*q.v.*) he played a noteworthy part as the originator of a plan for examinations. In 1773 he brought forward a scheme for an annual examination in May of all undergraduates, including noblemen and fellow commoners. The subjects of examination were to be " the law of nature and of nations, chronology, history, classics, mathematics, metaphysics, and philosophy, natural and moral." These examinations were to be " preparatory to the more important Examination for the Bachelor's Degree." (See his *Remarks upon the present Mode of Education in the University of Cambridge . . . a Proposal for its Improvement.*) The scheme was rejected and a syndicate appointed to consider the scheme reported unfavorably. In 1774, however, he secured the appointment of a committee, " to draw up a plan for the improvement of the academic course of the university." A scheme for examinations was proposed by the committee, approved by the Caput, but lost by one vote in the Senate. The question called forth several pamphlets against Jebb, to which his wife Ann, who wrote frequently under the name of " Priscilla," replied. In 1771 he had taken an active part in promoting the petition to abrogate the rule requiring subscription of the Thirty-nine Articles on admission to the B. A. degree. In 1775 he resigned his clerical functions on conscientious grounds, and in 1776 he left Cambridge and took up medicine which he practiced in London. In

1779 he was elected a Fellow of the Royal Society. He was a friend of Priestley (*q.v.*), who dedicated to him his *Doctrine of Philosophic Necessity* (1777). In politics he supported the movement for Parliamentary reform and universal suffrage.

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JEFFERSON, THOMAS (1743–1826). — Third President of the United States, "author of the Declaration of Independence, of the statute of religious freedom, and father of the University of Virginia," according to the inscription on his tomb at Monticello, which he prepared before his death. He was graduated from the College of William and Mary in 1762, studied law, and was admitted to the bar in 1767. Two years later he became a member of the Virginia House of Burgesses. He took an active interest in scientific agriculture, and after numerous experiments he succeeded in domesticating many European shrubs and trees in Virginia. As a member of the Virginia legislature he secured the passage in 1776 of the statute of religious freedom, which abolished the connection between Church and State.

In 1779 he introduced into the assembly of Virginia a measure that contemplated the establishment of a state school system that should meet the needs of all the children. His measure provided for the division of each county of Virginia into hundreds, and the erection of suitable schoolhouses and the maintenance of schools by the hundred settlers. His measure was democratic in that it provided free schools for all classes, and it was in advance of the time in making the same provision for the education of girls that was made for the boys. Secondary schools were also contemplated in his scheme, in the organization of which three or more counties were to coöperate; and at the head of the entire system was to be the college. Thus the three great branches of education were to be unified; and through an ingenious system based upon the survival of the fittest, the brightest pupils in the elementary schools of the hundreds would pass on to the county secondary schools, and the brightest pupils in the secondary schools would ultimately reach the college. The college, which represented the choicest products of democracy, was to furnish the state with its leaders. Talent, he maintained, was always latent in the common people; and the scheme that he proposed aimed to bring the highest education within the reach of the poorest boy in Virginia. The measure did not become a law, but Jefferson never ceased to believe in its reasonableness.

He was subsequently sent to France to join Franklin and Adams in negotiating commercial treaties; and during his five years' European residence he studied with care the educational systems of the Old World, and by means of correspondence kept the American colleges advised with reference to educational movements, appliances, and publications. He wrote to President Washington from Geneva concerning the feasibility of removing bodily to Virginia the entire teaching staff of the Swiss university.

After nearly forty-five years of public life, Jefferson retired from the presidency of the United States in 1809 and devoted the remaining fifteen years of his life to education. The public school system, which he had advocated as a member of the Virginia assembly nearly a half century before, was taken up with fresh vigor; and the correspondence on the subject with Joseph C. Cabell, a member of the state legislature interested in educational matters, covers 528 pages. In one of these letters he says: "A system of general instruction which shall reach every description of our citizens, from the richest to the poorest, as it was the earliest, so will it be the latest, of all the public concerns in which I shall permit myself to take an interest."

For nine years he labored earnestly with the legislature to secure the enactment of measures that would bring about a system of state education, such as he had proposed during the American Revolution; but the bills introduced by Cabell and other friends were successively defeated by one or the other branches of the Virginia legislature. Finally, in 1818, a bill was passed making an annual appropriation of $15,000 for the maintenance of a university "wherein all the branches of useful sciences were to be taught," with a special grant for the purchase of a site and the construction of buildings. Commissioners — including Jefferson, James Madison, and Joseph C. Cabell — were appointed by the governor, in 1819, to carry out the provisions of the law. Jefferson was selected rector, and "henceforth until his death in 1826," remarks the late Professor Herbert B. Adams, "he was the directing and shaping power in the upbuilding of the University of Virginia. From his original and sovereign interest in university education, and from his residence in immediate proximity to the university, the other visitors were well content to leave to him practically the entire management of affairs. Not only did he evolve the entire system of education there introduced, but he actually devised every feature of construction and administration. He drew plans, made estimates and contracts, busied himself about bricks and mortar, and superintended the whole process of building." (See Virginia, University of; College, American.)

Jefferson's views on university organization included: (1) the abolition of a prescribed curriculum and the adoption of an elective system, and (2) the reduction of discipline to a minimum, "avoiding too much government, by requiring no useless observances, none which shall merely multiply occasions for dissatisfaction, disobedience, and revolt." The purpose of a state university, as he saw it, was: (1) to form the statesmen, legislators, and judges, on whom public prosperity and individual happiness depend; (2) to expound the principles and structure of government, the laws which regulate the intercourse of nations, those formed municipally for our own government, and a sound spirit of legislation; (3) to harmonize and promote the interests of agriculture, manufactures, and commerce, and by well-informed views of political economy to give a free scope to the public industry; (4) to develop the reasoning faculties of our youth, enlarge their minds, cultivate their morals, and instill in them the precepts of virtue and order; and (5) to enlighten them with mathematical and physical sciences, which advance the arts, and administer to the health, the subsistence, and comforts of human life. W. S. M.

See French Influence in American Education.

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JENA, UNIVERSITY OF. — This university, which is under the joint control of the Grand Duchy of Saxe-Weimar, Eisenach, and the three Saxon duchies, owes its origin to a *Gymnasium* founded as a Lutheran seat of learning by the Elector John Frederick the Magnanimous in 1548. The institution was raised to the rank of a university by an imperial decree dated August 15, 1577, but the new university did not open its doors until February 2 of the following year. The dominant faculty for two centuries was that of theology, which at first reflected pronounced orthodox tendencies in contradistinction to the more liberal tendencies that flourished at the University of Wittenberg, but later became a center of rationalism. The halcyon days of the university fell between 1620 and 1720, when large numbers of students were attracted to its halls. Toward the close of the eighteenth century, Jena began to play a distinguished rôle in the field of philosophy, becoming a center for the dissemination of the theories of Kant, among its prominent teachers at this time being Fichte, Schelling, and Hegel. These were the days — the closing years of the eighteenth and the opening years of the nineteenth century — when the Duke Karl August reigned in Saxe-Weimar. Goethe came to his court in 1775 and Schiller some years later, and the former took an active interest in the affairs of the university, while the latter taught history there for a brief space, ill health compelling him to resign his chair. The activity displayed by Jena in the field of philosophy has been continued to the present day, Rudolf Eucken being at present head of the department. Jena is one of the few German universities at which emphasis has been placed upon the study of pedagogy, and the institution enjoys a well-deserved reputation in this field, the pedagogical seminar, in connection with which a practice school is maintained, being the first to have been established at a German university (1843). (See Education, Academic Study of.) The political economy seminar, founded about the middle of the last century, was also the first of its kind. Among well-known former professors of the university may be mentioned H. Hettner in Germanic, Georg Ebers in Oriental, and August Schleicher in Indo-Germanic philology, J. G. Droysen in history, and Bruno Hildebrand in political economy. More recently Jena has come into prominence largely through the teachings of Ernst Haeckel, who has filled the chair of zoölogy since 1865. Another field in which the university has won, and is still winning, much renown is that of physics and mechanics, more especially optics, a considerable fund for equipment and research in this and related lines having become available through the generous gifts of Carl Zeiss, the optical manufacturer of Jena. The theory of the microscope was first developed in the mechanical laboratory of the University of Jena by Professor Abbe, and the optical laboratory of the institution is to-day the leading one of its kind in existence. The university also maintains an agricultural school, in contradistinction to the custom prevailing in Germany of making provision for this subject in separate seats of learning, the Jena school being the continuation of a private agricultural institute founded in 1826 by F. G. Schulze as the first agricultural academy. The university possesses a Germanic museum, a valuable collection of Oriental coins, as well as excellent geological, mineralogical, and zoölogical collections. Among the medical institutes may be mentioned one for hygiene and one for psychiatry. The nucleus of the library is the collection transferred from Wittenberg to Jena after the surrender of the former town in 1548 and presented to the university at the time of its foundation ten years later. It contains almost 1000 Mss., about 100,000 dissertations, and over 200,000 volumes. A group of new and up-to-date buildings was erected between 1905 and 1908. The annual expenditures of the institution amount to approximately $160,000. In addition to the endowment provided by Carl Zeiss, which is available for various purposes in addition to those mentioned above, other funds have been supplied by private individuals — until quite recently a rather rare phenomenon in German higher education, among which may be mentioned the fund donated by Paul von Ritter for research in the field of phylogenetic zoölogy. In 1815 there was established at Jena the first of a series of democratic student societies known as the *Burschenschaften* (*q.v.*), which later played an important part in the political affairs of the nation, Prussians being forbidden to attend the university from 1819 to 1825. (See *Die Gründung der deutschen Burschenschaft in Jena.* Jena, 1883.) In point of winter attendance Jena ranks fourteenth among the German universities, although at one time it was one of the most frequented. In the winter semester of 1911–1912 it attracted 1831 students, of whom 93 were auditors. As at so many other German universities, more than half of the matriculated students were registered in the faculty of philosophy (1010), medicine enrolling 356, law 302, and theology (Protestant) 70. A well-attended summer school, which attracts students from all parts of the world, is also conducted. The teaching staff consisted of 101 professors and 20 docents. R. T. Jr.

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JEROME, SAINT (HIERONYMUS). — Early Latin Father, born at Stridon in Pannonia, about 340, died at Bethlehem, 420. About the year 360 he went to Rome, where he was baptized. Thence he went to the famous school of Trier, where he made his theological studies. After spending some time at Aquileia, he went in 373 to Antioch, and there he was ordained priest. In 381 he was at Constantinople, and in 382 he returned to Rome. There for three years he enjoyed the friendship and patronage of Pope Damasus. After the death of the pope in 384, he set out for Antioch, Alexandria, and Bethlehem. He reached the last named place in 386 and there he remained until his death in 420. His *Letter to Læta*, on the education of her daughter Paula is an important document in the history of early Christian education. Jerome advises that a teacher be selected who is of approved manner of life, of discreet age, and equipped with learning. The pupil, he says, should be given wooden or ivory letters and be taught their names. She should be encouraged both by healthy emulation and by games and amusements. She should not neglect the study of Holy Writ, but, beginning with the Psalter, should read the Proverbs, the Book of Job, and the Gospels. As to dress and manners, she should never lose sight of the fact that she is consecrated to God. Her religious education is all important, and the mother is charged in conscience with the duty of supervising the child's education from day to day. Similar advice is given in the *Letter to Gaudentius* on the education of Pacatula. It should be remembered that the severity of life prescribed by Jerome is justified in his estimation by the wickedness of the pagan world from the contamination of which he strives to save the young Christian maiden. W. T.

See Monasticism and Education.

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JERSEY, EDUCATION IN THE ISLE OF. — The first grammar schools date from the year 1496, when King Henry VII, by letters patent dated Nov. 15 confirmed the establishment and endowment of the free grammar schools of St. Magloire (now St. Maunelier) in the parish of St. Saviour's, and St. Anastace in the parish of St. Peter's for the teaching of grammar and the 'other lesser liberal sciences.' The appointment was in the hands of the dean and clergy of the island, and this was confirmed by a decision of the Privy Council in 1693, when the right of appointment was claimed by Charles de Carteret, Seigneur of Trinity. Scholars from this school passed to the University of Saumur, and this practice led to the separation of the Church in Jersey from the Church in England. Despite the fact that in 1499 the Channel Islands were transferred by Pope Alexander VI to the diocese of Winchester, the Bishop of Coutances exercised ecclesiastical jurisdiction as late as 1550. By that date the Reformation had taken its effect in Jersey, but the connection with Saumur made it follow the line of the French and Scottish Calvinists, with the result that the Presbyterian organization was introduced and a synod held on June 28, 1554. In 1619, however, the episcopal order was restored, and a code of canons for the Channel Islands received the royal assent on June 30, 1623. Canons forty and forty-one provided that there should be a schoolmaster in every parish to teach the children "à lire, escrire, prier Dieu, respondre au Catechisme; les duiront aux bonnes Mœurs, les conduiront au Presche, et Prieres Publiques, les y faisant comporter comme ils appartient." These schools had long existed; and were officially recognized by these canons. In the meantime efforts had been made to bring Jersey into connection with Oxford and Cambridge, and Laurens Bandains founded scholarships for the purpose, having failed in Queen Elizabeth's reign to found a university college in Jersey. In 1637 the Archbishop of Canterbury founded at Oxford three fellowships for the Channel Islands, and a little later the Bishop of Winchester (Morley) founded five scholarships for the islands at Pembroke College, Oxford. Thus Saumur was abandoned, and the last English link with France broken. The Jersey elementary schools were in the eighteenth century better than those in England, and most people in the island could read and write. In 1836 the National Society began to make grants to Jersey schools, and elementary education followed the normal English lines. By a *Réglement* of Aug. 9, 1872, when the Privy Council grants ceased, a system of education similar to that established in England by the Act of 1870 came into force.

J. E. G. de M.

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JESUITS, EDUCATIONAL WORK OF: OR EDUCATIONAL WORK OF THE SOCIETY OF JESUS. — The Society, or Company, of Jesus, was founded by the Spanish nobleman Ignatius of Loyola. The name " Jesuits " was given the members of the Society of Jesus by the opponents of the order, and occurs as early as 1544. According to an English educationist, " since the Revival of Learning no body of men has displayed so important a part in education as the Jesuits " (Quick).

Ignatius of Loyola. — Ignatius, or, as he was originally called, Inigo (after a Spanish saint Eneco), was born at the castle of Loyola, in Guipuscoa, one of the Basque provinces of Spain. The year of his birth is most probably 1491. Brought up in the house of a high official of Ferdinand and Isabella, the ambitious youth took service in the army, and in 1521, while among the defenders of Pampeluna against the French, was seriously wounded by a cannon ball. During the slow recovery the reading of the lives of Christ and the saints wrought a great change in the hitherto extravagant officer. Determined to abandon his worldly life, he retired to Manresa, where he spent some time in the practice of ascetical austerities, solitary prayer, and meditation on religious things. The inner experiences of this period of spiritual formation grew into the *Book of Exercises.* Through this little manual of practical asceticism Ignatius becomes one of the foremost religious educators of modern times, and in our own days continues to influence the spiritual training of hundreds of thousands of Catholics annually, in the so-called " retreats " and " missions." The " Spiritual Exercises " contained the germ of the future Society of Jesus. In 1523 Ignatius went to the Holy Land to devote himself there to a life of piety and labors for the conversion of the Moslems. Obliged to depart from Jerusalem, he recognized the necessity of further studies, in order to be of greater help to others. At Barcelona he learned Latin among little boys, then went to the universities of Alcala and Salamanca, 1526–1527, and finally to Paris, then the greatest center of learning in Christendom, where he studied philosophy and theology, 1528–1535. Although he took a creditable degree (M.A.), his distinction was less that of the scholar than of the guide and ruler of men and of the skillful organizer. A band of able and devoted students had gathered around Ignatius at Paris (Faber, Xavier, Laynez, Salmeron, Bobadilla, Rodriguez), and in 1534 at Montmartre, Paris, they took vows of poverty and chastity, besides the vow of going to the Holy Land and there leading a life in close imitation of the life of Christ. When they later found it impossible to embark for Palestine, they offered their services to the Pope. In 1539 they determined to form a compact religious order, and the outline of a constitution was approved by Pope Paul III in the following year. Ignatius was elected the first General of the order, and governed it till his death in 1556. He was canonized in 1622. The story of the life of St. Ignatius, especially the patience with which, in advanced age, he devoted eleven years to study, the careful deliberations and frequent consultations with others on important matters, are sufficient proof that he was not a mere " religious enthusiast," or a " visionary " (Macaulay). His work shows that he was a genius in the practical order, a man of " powerful gifts of intellect and an unusual practical foresight " (Littledale). But the most prominent characteristic of Ignatius was a burning zeal for the spread of Christianity and the religious and moral betterment of his fellow-men. Toward this end he directed his foundation, the Society of Jesus.

The Society of Jesus. — The official title of the order is " Society of Jesus "; but the name " Jesuits " was gradually adopted by its members and friends. Ignatius himself had used the Spanish word " Compañia," which might be translated " Regiment of Jesus." This term suggests the former military life and spirit of the founder and the active part which the order was to play in the service of the Church militant. It is, however, an erroneous opinion, held by many Protestants and some Catholics, that the Society was founded with the avowed intention of opposing Protestantism. Neither the papal letters of approbation nor the Constitutions of the order mention this as the object of the new foundation. In fact, when Ignatius began to think of devoting himself to the service of the Church, he had probably not as much as heard the names of the Protestant Reformers. His early plan was rather the conversion of Mohammedans, an idea which, a few decades after the final triumph of the Christians over the Moors in Spain, must have strongly appealed to the ardent and chivalrous Spaniard. It is a remarkable coincidence that the name *Societas Jesu* had been borne by a military order approved and recommended by Pius II in 1459, the purpose of which was to fight against the Turks and aid in spreading the Christian faith. The early Jesuits were sent by Ignatius first to pagan lands or to Catholic countries; to Protestant countries only at the special request of the Pope, and to Germany, the cradle land of the Reformation, at the urgent solicitation of the imperial ambassador. From the very beginning of the order, the missionary labors of Jesuits among the pagans of India, Japan, China, Canada, Central and South America, were at least as important as their activity in Christian countries. As the object of the Society was the propagation and strengthening of the Catholic faith, it is evident that the Jesuits endeavored to counteract the spread of Protestantism. They became the main instruments of the Counter-Reformation, which may rightly be styled the Catholic Reformation; the reconquest of southern and western Germany and Austria for the Church, and the preservation of the Catholic faith in France and other countries were chiefly due to their exertions.

Organization of the Society. — The object and spirit of the Society of Jesus are to be sought in the "Spiritual Exercises," which are the training school of the religious life of the Jesuits, and the Constitutions, which contain the laws of the order. The so-called *Monita Secreta*, or *Secret Instructions*, are spurious, and a libel on the order, composed by one Zahorowski, who had been dismissed from the order; this work has been styled a lampoon, an ingenious forgery, etc., by writers not friendly to the Society, as Döllinger, Reusch, Huber, Harnack, Littledale, and others. The Society has no secret doctrines, nor any teaching which is different from that held by the Catholic Church in general. The order is divided into provinces, which comprise the colleges and other houses within certain countries or districts. Several provinces form an assistancy, arranged according to nationalities, or geographical proximity; there are, at present, five assistancies: Italy (with five provinces), Germany (provinces: Germany, Austria, Hungary, Galicia, Belgium, Netherlands), France (with four Provinces), Spain (provinces: Aragon, Castile, Toledo, Portugal, Mexico), England (provinces: England, Ireland, Maryland-New-York, Missouri, New Orleans, California, Canada). The superior of a province is called provincial, the head of a college rector; both provincials and rectors are appointed, for a number of years, by the head of the whole Society, the General. The General is elected for life by the General Congregation, which is the legislative assembly of the order, and alone can add to the Constitutions, change or abrogate them. This General Congregation consists of the General (or after his death his Vicar), the Assistants (chosen by the previous Congregation, one from each assistancy), the provincials, and two special deputies, elected by each Province. The Congregation may even depose a General, for grave reasons, although such a step was never necessitated in the history of the order. Although the General possesses full administrative power, he is not an absolute ruler; the Assistants form his council, and the monarchical character of the government is tempered by various constitutional restrictions. The members of the order are divided into different classes or grades: the Professed Fathers, who, besides the three vows of religion, have made a fourth, of special obedience to the Pope in regard to undertaking foreign missions; the Formed Coadjutors, either spiritual, *i.e.* priests who have taken the final three vows of religion, or temporal coadjutors, *i.e.* lay brothers, engaged in domestic duties; the Scholastics, who after their first religious vows are engaged in studying or teaching; lastly, the novices, who devote themselves for two years chiefly to exercises of religion before taking their first vows. The Jesuit priests are admitted to the last vows only after a long course of studies and religious tests; the profession is granted only after from seventeen to twenty years of life in the Society. Before the suppression of the Society in 1773, the number of Jesuits had exceeded 22,000; in 1910 there were 16,293; of these 7848 were priests, 4385 scholastics, 4060 lay brothers. There is no class of lay affiliates, neither male nor female. The Jesuits are not monks, like the Benedictines, nor friars, like the Franciscans and Dominicans, but "Regular Clerics," or "Clerks Regular." St. Ignatius introduced several innovations, deviations from the life of the older religious orders. Thus there was no common choir, no distinctive religious habit, no prescribed austerities; a special vow was taken not to accept any ecclesiastical dignities, except at the peremptory bidding of the Pope. All these features were intended to free the Society from whatever might be an obstacle in the way of active work.

Object and Special Work of the Order. — The object for which the Society was instituted is expressed in the first papal approbation of the Institute in these words: "The progress of souls in good life and knowledge of religion; the propagation of faith by public preaching, the Spiritual Exercises and works of charity, and particularly the instruction of youth and ignorant persons in the Christian religion." This object is expressed in the Motto of the Society: *Omnia ad Majorem Dei Gloriam* (abbreviated O.A.M.D.G.), *i.e.* "All for the greater glory of God." Jesuit writers frequently designate the work of the Society as "apostolic," and this briefly expresses its character. In the occupations of the Society there is great variety, in fact, a universality, which embraces all activities which can further the glory of God and the betterment of men.

The Ratio Studiorum — From the beginning education occupied a very prominent place among the activities of the order. Frequent mention is made in official documents of "teaching catechism to children and the ignorant, lecturing on philosophy and theology in the universities, and instructing youth in the grammar schools and colleges." In fact, education so largely prevails in the activity of the Society that it can be called in a special sense a teaching, or school, order. Of the ten parts of the Constitutions the fourth treats of studies; it is the longest of all, and its clear and practical arrangement is worthy of admiration. Successive General Congregations emphasized the importance of educational work, calling it a " special and characteristic work of the Society," " one of the most desirable and beneficial occupations." In the final vows the Jesuit promises to have " a particular concern for the education of boys." During the lifetime of St. Ignatius, colleges were founded in Italy (Messina, Palermo, Naples, the Roman and German Collges), Spain (Gandia, Salamanca, Alcala, Valladolid), Portugal (Lisbon), France (Billom), and the German Empire (Vienna, Ingolstadt). Others were established soon after the death of St. Ignatius, as Cologne, Munich, Prague, Innsbruck, Douay, Bruges, Liège, Antwerp, etc. With the increase of the number of colleges the want of a uniform and detailed system of education was felt more and more. Plans of study were drawn up in different places, but they were merely private works. During the generalate of Claudius Aquaviva (1581–1615), the educational methods of the Society received a definite shape. In order to ensure a certain universality and uniformity (which were needed because men were often sent from one country to another), and at the same time to profit by the educational experiences of different countries, six able schoolmen were selected from different provinces and nationalities (France, Spain, Portugal, Austria, Germany, and Italy) and called to Rome, 1584. For a year these men studied pedagogical works, examined regulations of the most famous colleges and universities, and considered the suggestions submitted by prominent Jesuit educators. In 1586 the report drawn up by this committee was sent to the provinces to be examined by at least five experienced men in every province. The observations and criticisms obtained in this manner were utilized in the drawing up of a second plan, which, after careful revision, was printed in 1591. For some years the practical working of this plan was watched, and in 1599 appeared the *Ratio atque Institutio Studiorum Societatis Jesu*, usually quoted as *Ratio Studiorum.* It was the result of careful and most painstaking labor; from the manner in which it was drawn up it is evident that it was the work of the whole Society rather than of any individual.

Sources of the Ratio Studiorum. — The statement frequently made that the *Ratio* was modeled on the educational theories of the Spanish humanist Vives (*q.v.*), and the plan of studies of Johannes Sturm (*q.v.*), of Strassburg, needs considerable modification. Educational treatises and regulations were extensively consulted by the men who drew up the *Ratio, Studiorum,* and among the numerous documents examined was also Sturm's famous plan of studies. But Sturm acknowledges his indebtedness to the humanistic schools of the Netherlands, especially the celebrated school of the Brethren of the Common Life (*q.v.*) at Liège, of which he had been a pupil. Some of the ablest early Jesuits were natives of the Netherlands, or had studied in the schools of that country, which were among the best in Europe at that time. It is natural to think that these schools were the chief model for the literary course of the *Ratio* as well as of other systems and plans. In fact, several features common to the *Ratio* and Protestant schools were found in Liège and other humanistic schools, of the Netherlands. The method of teaching philosophy, the sciences, and theology was essentially an adaptation of the system prevailing in the University of Paris, where Ignatius and his first companions had studied. Still, as is clear from the description of the origin of the *Ratio,* the chief source was the collective experience of Jesuit teachers in various colleges and countries.

Later Modifications. — Until the time of the suppression of the Society (1773), the *Ratio Studiorum* remained, in all its essential features, the authoritative plan of studies in the schools of the Society. This does not mean that there was absolute uniformity in all colleges. The Constitutions and the *Ratio* repeatedly declare that, according to special needs and circumstances, changes may be introduced. In some countries the teaching of the vernacular language and the systematic study of history and geography were added to the original classical curriculum. Certain kinds of punishment, competition, and reward, popular in southern countries, were allowed to be abandoned in northern countries. The need of a more thorough reform was felt after the restoration of the Society (in 1814), as it was evident that the changed conditions of intellectual life demanded more radical modifications of the curriculum. Under the General Father Roothaan, the revised *Ratio Studiorum* was published in 1832. Nothing was changed in the fundamental principles, nor in the general mode of teaching, but innovations were made chiefly in regard to branches of study. Latin and Greek remained the principal subjects, but henceforth more time and care were to be devoted to the mother tongue and its literature, to history, mathematics, and the natural sciences. For the teaching of physics and chemistry separate regulations were made, which are indicative of the broad and progressive attitude of the revision: " The theoretical treatment is to be supplemented by experiments, and as these sciences make daily progress, it is the duty of the professors to acquaint themselves with the latest discoveries, and to advance in their lectures as the sciences progress." Since 1832 the non-classical branches have been emphasized more and more; non-classical schools have been declared to be in accord with the work of the Society as well as classical institutions. In modern Jesuit colleges physics, chemistry, astronomy, geology, biology, physiology, and other branches are taught according to the established principles and methods of modern science. In the words of the present General of the Society (F. X. Wernz), "As the early Jesuits did not invent new methods of teaching, but adopted the best methods of their age, so will the Jesuits now employ the best methods of our own time." Undoubtedly, the Jesuits were always conservative and did not immediately adopt every educational experiment; nor were the changes which seemed necessary introduced with the same readiness and celerity everywhere. In some countries (as in Austria), the Jesuits adopted the system prevailing in the state institutions; nearly everywhere the Jesuit colleges adapted themselves, in a considerable degree, to the national schools and the prevailing educational currents. The last General Congregation of the Society (1906) gave official recognition to this tendency by the following important decree: " Under the present conditions a new revision of the *Ratio Studiorum* is not to be attempted. Not even the *Ratio* of Father Roothaan can be satisfactorily carried out, on account of the special needs of different countries. For this reason the provincial superiors, after consultation with their advisers and the most approved teachers, should devise plans of studies for their provinces, and for the various districts in which the same conditions prevail." There is, accordingly, no longer a uniform *Ratio Studiorum* in force, as far as subject matter and arrangement of studies are concerned.

Contents of the Ratio Studiorum. — Theoretical discussions on the educational value of different branches and similar topics were contained in the trial *Ratio* of 1586, but were absent from the final *Ratio* of 1599. The latter document was rather a code of laws, a body of practical rules drawn up by practical teachers, a collection of regulations for the officials and teachers. I. Rules for the provincial superior; for the rector (president) in whose hands is the government of the whole college; for the prefect of studies, the chief assistant of the rector, entrusted with the direct supervision of the classes and everything connected with instruction; another assistant of the rector, the prefect of discipline, responsible for all that concerns order and discipline. II. Rules for the professors of theology: Scripture, Hebrew, dogmatics, moral theology, ecclesiastical history, Canon Law. III. Rules for the professors of philosophy, mathematics, physics, and other natural sciences. IV. Rules for the teachers of the *Studia Inferiora*, the lower department, devoted chiefly to literary studies. Originally there were five classes in this department, later frequently six: the three (or four) " Grammar Classes," corresponding with a classical High School; then the class of Humanities (Freshman) and the class of Rhetoric (Sophomore). Latin and Greek were the main branches in this department; other subjects, as history, geography, antiquities, were taught, under the name of " accessories," in connection with the classics. In the course of the seventeenth and eighteenth centuries history and geography began to be taught as separate branches in many provinces, and graded textbooks — usually six small volumes — were used extensively in France and Germany. Treatises on the method of teaching history and geography were in the hands of teachers in the beginning of the eighteenth century. Foreign languages were taught early in various places, *e.g.* French and Italian at Dillingen since 1655. Mathematics and natural sciences were considered as belonging to the department of " Arts," and were taught in the course of philosophy, since the revision of the *Ratio* in 1832, also in the lower department. In 1843 the curriculum of the college of Fribourg in Switzerland, one of the model colleges of the Society, contained the following subjects in the lower department (high school): Religion, Latin, Greek; French, German (one obligatory); history and geography (in all classes); arithmetic, algebra, geometry; in the higher (college) department, besides philosophy: physics, chemistry, astronomy, botany, zoölogy, mineralogy; plane and spherical trigonometry, higher algebra, analytical geometry, differential and integral calculus; philosophy of history, and an advanced course in literature. In addition to these obligatory courses, Hebrew, Italian, English, and Spanish were offered as electives. This is an instructive example of local adaptation and modification, which shows how misleading it would be to take the text of the *Ratio* as an absolute indication of what was actually taught.

Philosophy was regarded as the desirable crowning of general training for all, and an important preparation for strictly professional studies. The system followed in philosophy and theology was the scholastic, or rather " neo-scholastic," *i.e.* scholasticism as developed by the Post-Reformation Catholic teachers, particularly the great representatives of the Society: Suarez, Vasquez, Molina, etc. The old *Ratio* had prescribed Aristotle as the chief guide and standard author in philosophy, "except where his teaching is contrary to the Christian faith, or the commonly accepted doctrine of the [Catholic] Schools." The revised *Ratio* no longer mentions Aristotle as guide, although his philosophy continued to be followed largely in logic and metaphysics. In theology St. Thomas Aquinas (*q.v.*), was "the proper Master, but not so as if no deviation from his teaching were permitted on any point," particularly in regard to questions treated more fully by later authors.

The *Ratio* does not contain any provisions for elementary education. The cause of this omission is not, as has been imagined, contempt for this branch of educational activity, much less opposition to popular instruction, but the practical impossibility of entering that vast field. The Constitutions and General Congregations declare elementary education to be "a laudable work of charity, which the Society might undertake if it had a sufficient number of men." As there was often a dearth of men even for college work, and as the whole training of the Jesuits fitted them better for higher education, it would be unreasonable to blame them for thus limiting their work. In places, however, where elementary education was much neglected, especially in mission fields, the Jesuits frequently devoted themselves to this work, employing chiefly able lay brothers as teachers.

Character of Jesuit Education. — The following features may be mentioned as most characteristic of Jesuit education. First, it was a system, well thought out and well worked out, and that at a time when in most schools there was little system; although the Jesuits had largely borrowed from other men and institutions, they had done so intelligently; above all, they had unified and systematized educational principles and methods in a manner never done before. The many practical rules laid down for the different classes and teachers, the careful supervision, the close unity and centralization, could ensure efficiency even in the case of teachers of moderate talent, while to teachers of more than ordinary ability sufficient scope was left for the display of their special aptitudes. Provisions were made for systematic professional training of the teachers; as early as 1565 the second General Congregation urged the establishment of a special pedagogical "seminary" in every province. Literary, philosophical, and scientific training, although given not simultaneously, but successively, formed a fair combination, which avoided the one-sidedness of pure scholasticism, and the still greater one-sidedness of humanism, or of later purely scientific education. At a time when barbarous punishments were common in schools, the discipline of the Jesuit colleges was comparatively mild; corporal punishment was inflicted rarely and only under rigid precautions. Playing was encouraged, and general attention paid to the physical welfare of the students. The teachers were urged to take an interest in all the concerns of the individual student, and much was expected from personal contact between teacher and pupil. All teaching was to be gratuitous; fees were not admitted until, in later times, the spoliations of Jesuit property and the absence of sufficient endowments necessitated the acceptance of tuition money. From its beginning the Society took a warm interest in needy talented students, and in many places founded and supported boarding houses (*convictus*) for them. The most important aim of education, the one emphasized for all grades, and in the rules for all superiors and teachers, is the moral and religious training. To this end were directed the teaching of catechism, the practice of receiving the Sacraments of Penance and Communion, the pious associations of students, called "Sodalities"; even the classics were to become "Heralds of Christ," by being interpreted in the light of Christian revelation. The determination to safeguard Christian faith and morality explains the rigid exclusion of books inimical to revealed truth, and the careful expurgation of all obscene and vulgar passages from the pagan writers used as textbooks. In this there was a radical and intentional reaction against the paganizing tendencies found in such humanists as Valla, Poggio, Beccadelli, etc., and in many Renaissance schools. The educational ideal of the Jesuits was like that of the Brethren of the Common Life (*q.v.*); namely, piety adorned with learning, or culture on the basis of religion (*pietas literata*).

Intellectual Scope and Methods of Teaching. — The intellectual aim of the literary course was that common to all humanistic schools; it has been well expressed in the two words: "learning" (classical) and "eloquence" (*sapientia et eloquentia*). This meant the acquaintance with the thoughts of the classics, mastery of the Latin language, and the acquisition of a good Latin style. During the sixteenth and seventeenth centuries Latin remained to a great extent the medium of political and scholarly intercourse; hence it was of considerable practical use, and Protestant and Catholic schools alike aimed at imparting the mastery of it. This practical use, however, was not the only object sought in teaching the classics. In 1669 a French Jesuit educator wrote: "Besides literary accomplishments gained from the study of the classical languages, there are other advantages, especially an exquisite power and facility of reasoning." Here we have an early expression of what now is called the theory of mental training, or formal discipline. This aspect of classical teaching was, naturally, more emphasized by Jesuits and other educators after the directly practical use of Latin could no longer be urged.

The means of acquiring a knowledge of the classical languages was a carefully planned system of coördinate exercises: the "prelection," memory lessons, repetitions (daily, weekly, monthly, annual), compositions, disputations, contests, and examinations. The typical form of Jesuit teaching, the "prelection," is minutely described in the *Ratio*. It means "lecturing" in the higher faculties; its equivalent, *Vorlesung*, is at present used in German for the lectures in universities. In the lower grades it means "explanation," and is applied to the translation and interpretation of authors as well as to the explanation of the precepts of grammar, poetry, rhetoric, and style. One part of the prelection is called "erudition," which means the explanation of various details contained in the text: historical, geographical, archæological, biographical, political, ethical, and religious. In the philosophical course the frequent disputations constitute the most important exercise. An inheritance of the medieval universities, they were retained for a long time also in Protestant institutions. In fact, the intellectual aims and practical methods were nearly the same in Protestant and Jesuit schools; the chief difference is found in the greater systematization and centralization of the Jesuit system. In both Protestant and Catholic colleges of former centuries the school drama was an important feature; in Jesuit colleges it was cultivated to a remarkable degree for the purpose of training in speaking and acting, and even more for religious edification and moral elevation. Not a few of the numerous Jesuit productions possessed more than ordinary dramatic value.

Criticism. — Few systems of education have been the subject of such conflicting valuation as that of the Jesuits. Many have praised it enthusiastically — some even extravagantly; — others, especially in recent times, have severely censured it. That extremes in this, as in other matters, are to be avoided is evident. The Society itself did not consider its educational system absolutely perfect, as is clear from the frequent inquiries about its working, from repeated requests for suggestions concerning improvements, and most of all, from the various revisions and gradual transformation of the system. Leading historians of the order (*e.g.* Duhr, *Geschichte der Jesuiten*, I, p. 259), admit that, especially in the old *Ratio*, there were defects, as the relative neglect of history, geography, and other branches, which were taught only as "accessories" to the classics. How this defect, common to all schools of former centuries, was gradually remedied has been mentioned before. Again, the old curriculum was, undoubtedly, too purely literary, too prominently classical, and neglected subjects which were rightly insisted on by the later "realistic" educators. Nor can it be denied that the humanistic conception of the importance of "eloquence and style" was exaggerated and one-sided, and was open to the charge of excessive "formalism." Much, however, of current criticism of Jesuit education is due to misunderstandings. The very terminology of the *Ratio Studiorum* has led some into serious errors. Certain regulations, meant for the "Scholastics," *i.e.* members of the Society engaged in studies, have been interpreted as applying to other students. Many critics forget that educational principles and practices, established in the sixteenth and seventeenth centuries, should not be judged according to twentieth-century standards. There would be much force in such criticism, if all the older practices had been retained in the Jesuit colleges of our own days. Such seems, indeed, to be the conviction of some critics, as when it is asserted that "the *Ratio Studiorum* devised by Aquaviva is still obligatory in the colleges of the Society" (*Encyclopedia Britannica*, 11th ed., Vol. XV, p. 342). How little this accords with actual conditions is clear from what has been said on the modifications of the educational system of the Jesuits. Many secondary features of the *Ratio*, as the colloquial use of Latin, certain means of fostering emulation, the employment of boy monitors, have long ago been abolished in most places. A great deal might be said in defense of certain much censured features, *e.g.* emulation. "An excess was, perhaps, not always avoided; but it should be remembered that some emulation is indispensable in the schools" (Paulsen, *Geschichte des gel. Unterrichts*, Vol. I, p. 341).

In more recent years the Jesuit system has been censured for maintaining prescribed courses instead of a broad electivism, for retaining the classics and upholding the theory of mental discipline. These charges need not be discussed here, as they do not concern Jesuit colleges alone; the controversies on these points are not yet closed, but in the case of some, notably the question of electivism, there is a reaction toward the view defended by the Jesuits. Dr. Elmer E. Brown has well observed that in many of these controversies "the Jesuit side is the side of many who are not Jesuits" (*Educational Review*, December, 1904). The most common and most serious charge against Jesuit education is that it suppresses "originality and independence of mind." In reply, the Jesuits can point to the variety of scholarship found in their own midst, as well as to the great number of pupils who achieved distinction in most varied spheres of life: poets like Calderon, Torquato Tasso, Molière, Goldoni; orators like Bossuet; jurists like Pothier, the greatest French jurist before the Revolution; scientists and historians like Galileo, Cassini, Réaumur, Buffon, Lalande, Descartes, Muratori, Ducange. Father Porée, Voltaire's teacher, saw many of his pupils — it is said nineteen — elected members of the French Academy. It would be absurd to claim all the greatness of these men for the system under which they were brought up. Some Jesuit pupils, as Voltaire and Lamarck, became famous for opinions which they had not been taught by their Jesuit masters. But this last fact seems to prove all the more conclusively that their originality was not crushed by the system. If, however, by " independence of mind " is understood unrestrained liberty of thought in religious matters, it must be admitted that the *Ratio Studiorum* and the whole Institute of the Society are uncompromisingly opposed to it, and that the Jesuits always endeavored to suppress it. For they are bound by their profession and fully determined to uphold, defend, and propagate revealed religion, as taught and interpreted by the Catholic Church. In this they do not differ from other religious orders, nor from any consistent Catholics.

Jesuit Schools before the Suppression. — For some time the Jesuits possessed almost the monopoly of higher education in various Catholic countries. On the eve of the suppression the Society had 669 colleges and a number of other institutions of higher learning, or, in round numbers, about 700 higher schools. Some of the colleges had more than 2000 students each; it is impossible to give an exact average, but 300 seems to be very low. Accordingly the 700 institutions would have numbered over 200,000 students, from which it follows that the educational influence of the Jesuits in those days was extraordinary. In Latin America alone there were 90 colleges; in the north was the flourishing college of Quebec (since 1635); and a report of 1711 states that there " grammar, the humanities, rhetoric, mathematics, philosophy, and theology are taught, perhaps with greater regularity, exactness, and fruit than in many colleges in France." Owing to the Penal Laws, which were especially severe and explicit in regard to the Jesuits, it was impossible for them to have schools with a full college curriculum in the English colonies. Still, they attempted to open higher schools when and where opportunity offered. Thus they had a classical school in New York for some time under the Catholic Governor Dongan, about 1684. In Maryland a school under their direction is mentioned at Newtown about 1640, and in 1677 a " school of humanities " was established, a Latin school of a preparatory character. In the midst of government opposition, legal penalties, and the hostility of part of the Protestant population, the Jesuits continued their educational activity in that colony for a long time. Before the middle of the eighteenth century their school was at Bohemia, Md. Georgetown (D.C.), which was opened after the War of the Revolution, may be regarded as a successor to Bohemia. Elementary schools were maintained in the Jesuit missions of South and North America. In the mission schools of Lower California, and especially of Paraguay, besides reading and writing, also music was taught and manual training given. In Canada the Jesuits had established " Seminaries," *i.e.* elementary schools for European and Indian children, and they called religious women from France for the education of girls. After 1740 elementary schools were opened in various Catholic settlements, chiefly German, in Pennsylvania, of which the Jesuits had charge. " Tracing things to their commencement and their cause, we must attribute to the Jesuits, more than to any other single influence, the establishment of the Catholic school system, such as it exists to-day. . . . It is principally to the Jesuit schools in Maryland and Pennsylvania that we owe the development of the Catholic parochial school system in the United States " (Burns, *The Catholic School System in the United States* pp. 89, 164).

Jesuit Schools in Modern Times. — The expulsion of the Jesuits from France, Portugal, and Spain through the absolutist Bourbon courts, and the suppression of the order by Clement XIV (1773) at one stroke annihilated the vast educational organization of the Jesuits in all parts of the world, with the exception of Prussia and Russia, where their schools were maintained by the express orders of two freethinking rulers, Frederick the Great and Catherine II, because, as these sovereigns declared, the Jesuits were the best teachers available for their Catholic subjects. The suppression meant to the Jesuits the total loss of their colleges, libraries, observatories, and all property. After the restoration (1814) the order struggled into existence under very unfavorable conditions. There was hardly a year during the nineteenth century that the Jesuits were not harassed in one country or other, or even driven into exile. It is evident that such persecutions were most detrimental to educational activity, and they were the principal cause which prevented the Jesuits from obtaining results similar to those of former centuries. Still, the number of colleges has increased considerably, especially in English-speaking countries. At present the Jesuit colleges all over the world number about 225. In North America there are in Canada the colleges of Montreal (two) and St. Boniface (Manitoba); in the United States forty-one colleges, with over 16,000 students. Recently several American colleges have expanded into universities, with medical and law faculties, as Georgetown (D.C.), Fordham (N.Y.), St. Louis, and Omaha. In foreign countries the most prominent Jesuit schools are the Gregorian University in Rome (successor to the old Roman College, which, with its observatory, precious library, and *Museo Kircheriano*, was secularized by the Italian government); Stonyhurst (*q.v.*), Beaumont, Liverpool, Mount St. Mary's, Stamford Hill, Wimbledon (England); Clongowes, Dublin (2), Mungret, Limerick (Ireland); Sydney (2), Melbourne (2), (Australia); Grahamstown (South Africa); several institutions in Belgium;

Innsbruck (university), Feldkirch, Kalksburg (Austria); Kalocsa (Hungary); the university in Beyrut (Syria); Bombay, Calcutta, Trichinopoli (India); Manila (Philippines); Zi-ka-wei (China). In mission countries numerous elementary schools are under the direction of the Jesuits.

The following is a list of Jesuit colleges and schools in the United States: —

New York		
St. Francis Xavier	New York City	1847
Fordham University	New York City	1841
Loyola School	New York City	1900
Brooklyn College	Brooklyn	1909
Canisius College	Buffalo	1870
Novitiate of St. Andrew	Poughkeepsie	1903
Massachusetts		
Boston College	Boston	1864
Holy Cross College	Worcester	1843
New Jersey		
St. Peter's College	Jersey City	1878
Pennsylvania		
St. Joseph's College	Philadelphia	1851
Maryland		
Loyola College	Baltimore	1852
Woodstock College	Woodstock	1869
District of Columbia		
Georgetown University	Washington	1780
Gonzaga College	Washington	1821
Missouri		
St. Louis University	St. Louis	1818
St. Stanislaus Seminary	Florissant	1823
Ohio		
St. Xavier College	Cincinnati	1831
St. Ignatius' College	Cleveland	1886
St. John's College	Toledo	1898
Michigan		
University of Detroit	Detroit	1877
Illinois		
Loyola University	Chicago	1870
Wisconsin		
Marquette University	Milwaukee	1864
Sacred Heart College	Prairie du Chien	1880
Nebraska		
Creighton University	Omaha	1879
Kansas		
St. Mary's College	St. Mary's	1848
California		
St. Ignatius' College	San Francisco	1855
Santa Clara College	Santa Clara	1851
Los Angeles College	Los Angeles	1911
Sacred Heart Novitiate	Los Gatos	
Washington		
Gonzaga College	Spokane	1887
Seattle College	Seattle	1892
Louisiana		
College of the Immaculate Conception	New Orleans	1847
Loyola College	New Orleans	1910
St. Charles College	Grand Coteau	1838
St. John's College	Shreveport	
Alabama		
Spring Hill College	Spring Hill	1830
Florida		
College of the Sacred Heart	Tampa	1899
Georgia		
Sacred Heart College	Augusta	1900
St. Stanislaus College	Macon	1887
(formerly Pio Nono College)		1871
Texas		
St. Mary's University	Galveston	1854
Colorado		
College of the Sacred Heart	Denver	1876

Literary and Scientific Activity. — In connection with the educational work of the Jesuits brief mention must be made of their literary and scientific work, because it was largely done by college professors and is an indication of their scholarly interests and attainments. The *Bibliothèque de la Compagnie de Jésus*, published by Sommervogel (1890–1909), contains in ten folio volumes the names of over 15,000 Jesuit writers and several times as many titles of works composed by them. Many of these treat of ascetical and theological subjects, and may here be left out of consideration, except the catechetical works of about 400 Jesuits, which, in numerous languages and editions, were a powerful means of religious instruction of youth. In particular, the catechisms of Peter Canisius and Bellarmin, were for centuries in almost universal use throughout the Catholic world; in recent times the catechisms of Father Deharbe obtained an immense circulation, not only in Europe, but also in America. A great number of the works composed by Jesuits deal with literary and scientific subjects. It is but natural to assume that in so vast a number there are many productions of not more than ordinary quality; but a respectable portion are of more than common, even of exceptional value. Not a few Jesuit writers have gained great distinction in various fields of scholarly activity, as some of their bitterest enemies are compelled to acknowledge. " In mathematics and natural sciences there are among the Jesuits writers who stand in the first rank " (Huber, *Der Jesuitenorden*, p. 418). And long before D'Alembert had written in a violent attack on the order: " Let us add — for we must be just — that the Jesuits have successfully cultivated eloquence, history, archæology, geometry, and literature. There is scarcely a class of writers in which they have no representatives of the first rank." Only a few names can be mentioned here: Beschi, Ricci, Prémare, Gaubil (oriental philology), Hervas (comparative philology), Tiraboschi (literary history), Petavius (chronology), Hardouin (history), the Bollandists (history and criticism), Kircher (various branches of learning), Clavius (mathematics and calendar reform), Saccheri (non-Euclidean goemetry), Riccioli, Scheiner, Grimaldi, Boscovich (mathematics, astronomy, optics, physics), Secchi (physical astronomy and meteorology). Some of these men made important discoveries and through their researches have contributed to the advancement of science. With a considerable number of Jesuit colleges observatories were connected. According to Montucla, at the time of the dispersion of the Jesuits, 130 observatories existed all over the world. Of these thirty-two, *i.e.* one fourth, were directed by the Jesuits. At the present day, more than twenty Jesuit colleges possess observatories, astronomical, magnetic, meteorological, or seismological. Great services have been rendered to science and navigation especially by the meteorological observatories of Belen (Havana) and Manila.

Summary. — Jesuit colleges and Jesuit education stand for a great deal more than mere classical culture. There is reason to think that opposition to the religious principles of the Jesuits has prevented many critics from forming a correct appreciation of the educational work of the order. It should certainly be possible to separate clearly considerations of religious tenets from questions of educational methods and efficiency. This has been done by men like Bacon, Grotius, Ranke, and others, who spoke with admiration of the zeal and success of Jesuit educators. Of recent writers, who had judged with independence and fairness, it will suffice to mention Professor Paulsen, one of the greatest historians of education. " No one can doubt," he writes in his classic work on higher education, " that the *Ratio Studiorum* was worked out with extraordinary care and with much intelligence. . . . Nor do I doubt that the order through its schools has effectually furthered the spread of intellectual culture, especially classical learning, in Catholic lands. The Jesuits were certainly the most learned and most zealous teachers that could then be had in Catholic countries. And that they were not unskilled teachers has been proved by their success " (*Gesch. des gel. Unt.* Vol. I, p. 423). In his last work the same writer adds: " The success of the order was brilliant, almost overwhelming; in two generations it had become ' the order of professors ' in the Catholic world. One must, undoubtedly, assume that this success was, on the whole, gained through positive achievements." (*Das deutsche Bildungswesen,* 1906, p. 52.) A system which produced such results must, from the beginning, have contained features of unquestionable merit. It embodied, says another writer, " much educational wisdom and experience, practical skill, and a pedagogical insight which never swerves from the main purpose " (Fleischmann). It contained much that is of permanent value in education.

R. S.

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JESUS AS A TEACHER. — See NEW TESTAMENT, PEDAGOGY OF THE.

JEWELL, FREDERICK SCHWARTZ (1821–1903). — Educational writer and institute lecturer, studied at Yale College and was graduated from the Auburn Theological Seminary in 1849. He was principal of secondary schools in New York and Pennsylvania (1849–1854), instructor in the State Normal School at Albany (1854–1868), institute instructor for the department of public instruction in New York state (1869–1878), and professor in Racine College (1884–1889). He was author of textbooks on grammar and civics and of numerous essays on education. W. S. M.

JEWETT, MILO P. (1808–1882). — First president of Vassar College, was graduated from Dartmouth College in 1828 and the Andover Theological Seminary in 1833. He was professor in Marietta College (1834–1838); principal of the Judson Female Institute at Marion, Ala. (1838–1855); principal of the College Hill Seminary at Poughkeepsie (1855–1862), and president of Vassar College (1862–1864). His publications include *Education in Europe* (1863) and *Academies* (1875).

W. S. M.

See Vassar College.

JEWISH EDUCATION. — Ancient Period. — The Jews, long before any other nation of antiquity, formulated an educational ideal and expressed the aim of education in terms of character formation, based on religious and ethical principles. The product of a sound education was to be a God-fearing man (Deut. x, 12; Prov. i, 7), for "the fear of the Lord is the beginning of wisdom." The Jews did not, as the Greeks, create God in the shape and with the qualities of man, but man was created in the image of God, and his ideal was to be found in God. Unlike their neighbors, even the most civilized, the Jews did not practice the exposure of children, for none was so unfit that it could not learn God. Indeed, the reward for true observance of faith was increase of progeny; "happy is the man that hath his quiver full of them" (Ps. cxxvii, 5). Schools as such were unknown in Biblical times, because it was felt that the education of children was the business of the family. It was the duty of the parents to act as interpreters to their children of the annual festivals and the religious rites and ceremonials, all of which served as object lessons in the history of their ancestors and as practical religious and moral training. (See, especially, Exod. xii, 26, 27; xiii, 8, 14; Deut. iv, 9, 10; xxxii, 46, etc.) More particularly was it the duty of fathers to hand down the national traditions (Deut. iv, 19; vi, 6; Ps. xliv, 1; lxxviii, 3–6), and to explain local landmarks (Josh. iv, 6, 21). But it is clear that the mother also had an important educational function (Prov. i, 8; vi, 20). That the welfare of the State depends on the well-being of the family was also recognized (Fifth Commandment). Reading and writing (Deut. vi, 9; xxvii, 8; Josh. xviii, 9; Judges viii, 14; Job xxxi, 35, etc.), and sufficient arithmetic to calculate dates of festivals and everyday needs were included in the curriculum. History and songs formed part of the life of the nation. With the Jews, as with the Greeks, life was education, though the content was different. How strongly rooted the religious ideal of education was among the Jews may be gathered from the fact that, in spite of the material greatness and wide intercourse with the world, a worldly culture did not arise. Typical of the literature of this period (*c.* 1000 B.C.) is the Book of Proverbs, the whole of which may be read as the expression of the educational ideals of the time, with its emphasis on the importance of both the father and the mother in the education of the child, with its stress on habit ("Train up a child," etc. xxii, 6); on the value of reproof as a mode of guidance (x, 17; xii, 1); on the importance of discipline and the rod of correction (xxii, 15; xxiii, 14; xxix, 15, etc.); and with its description of the virtuous woman (xxxi). The so-called "schools of the prophets," reputed to have been established by Samuel, were probably nothing more than associations of kindred spirits interested in the same work.

Under the influence of Ezra and Nehemiah the sacred writings acquired a new value and became an object of definite study. From this time on the Jews were the people of the Book. "The sacred writings became the spelling book, the community a school, religion an affair of teaching and learning" (Wellhausen). A new class of instructors (*Sopherim* or Scribes) arose, as opposed to the Levites or official interpreters. The synagogues at a later date became places of instruction and discussion (cf. Philo, and Matth. xxi, 23; Luke ii, 46, etc.). Ezra is credited, but on little authority, with the establishment of a school system. In the second century B.C. Hellenistic influence made itself strongly felt among the Jews. Greek customs and a gymnasium were introduced into Jerusalem (1 Macc. i, 14; 2 Macc. iv, 9, 12). This, indeed, is the first reference to physical exercise, although young men over twenty were expected to bear arms (Numbers i, 3; xxvi, 2; and later 2 Chron. xxv, 5). The sages recommended the study of Greek and even the translation of the *Torah* into that language, because "only by Greek can it be adequately rendered." Furthermore, Greek was taught to girls as an accomplishment, although as a rule girls were only trained in household work and the duties of motherhood. It is not necessary here to do more than refer to the intellectual influence of the Hellenized Jews, for example, in Antioch and Alexandria, where Greek was more familiar than Hebrew, or to the merging of Greek and Hebrew philosophy and early Christian doctrine into the school of Neoplatonism. Nor was this contact with the world around a very late development; Theophrastus speaks of the Jews as a race of philosophers (φιλόσοφοι τὸ γένος ὄντες).

That the education of children was almost wholly domestic has already been mentioned. But the problem of the education of orphans had to be faced, and about 70 B.C. an educational system was established by Simon ben Shetach in Jerusalem, with compulsory attendance. The details of this law cannot be traced, but it seems highly probable that the education of orphan children of sixteen years of age was intended. A century later, however, the High Priest, Joshua ben Gamla, passed a law providing for the establishment of elementary schools, with compulsory attendance from the age of six. Attendance before that age was strongly discouraged. Children would come to school equipped with a knowledge of reading, of some extracts from the Pentateuch, and the ceremonials learned from the father. By this law each community had to provide a teacher for every twenty-five children, with an assistant if the number rose to forty, and another teacher if the number reached fifty. The curriculum was religious, consisting of the Scriptures and anything arising out of this in the way of arithmetic, history, geography, and general knowledge. Josephus (*Contra Apion*, I, 12) says "Our chief care of all is to educate our children," and elsewhere (*ibid.* II, 18) "from their earliest consciousness they had learned the laws so as to have them, as it were, engraven on their souls." The last statement is corroborated in almost similar terms by Philo (*Legat. ad Gaium*, sec. 31). How successful the system of education was may be shown by the testimony of Josephus (*Vita*, 2), who declares that at fourteen he could expound the most abstruse questions of law, a fact which may be confirmed by reference to the story of the Christ Child in the Temple (Luke ii, 46, 47).

Academies. — One of the most interesting illustrations of the influence of education on the survival of a nation is that presented by the Hebrew academies (*Beth hamidrash*). The synagogues had already been centers of study, probably from the time of Ezra, for in addition to the prayers, passages from the Holy Writ were read and explained to the people. After the destruction of the Temple Johanan ben Zakkai obtained permission from Vespasian to establish an academy at Jamnia or Jabneh, which became the new center for Jewish life. Here the traditional literature and laws of the nation were discussed, legal and ritual questions were decided; contradictions in the law were settled; theoretical and hypothetical questions were considered at length, and the foundation for future development was laid.

Under Gamaliel II the academy at Jabneh acquired great influence. Young men flocked here for training and ordination as rabbis, with power to teach, judge, and, with limitations, to decide on questions of ritual. Other academies sprang up at Lydda, Bekiin, Usha, Sepphoris, Cæsarea, and Tiberias. With changing political conditions and the eminence of the teachers, the influence moved from one place to another. The right of ordination was at first vested in the patriarch, whose office was hereditary in the house of Hillel, but later was exercised by the patriarch and council. A formal order and routine gradually sprang up according to which the privilege of speech was regulated and ranged from the president of the academy (*Rosh Yeshibah*) through the sages and ordained students to the unordained disciples or candidates (*haberim*), with the power to sum up reserved to the president. In this way was accumulated the lore which for many generations was handed down orally. Since hardly any limits were set to the discussions, almost every field of knowledge was touched upon, including theology, philosophy, mathematics, astronomy, astrology, medicine, geography, history, architecture, botany, and animal anatomy; etiquette and manners were also discussed. By 219 these traditions were collected by Rabbi Jehuda Hanasi (the Prince), head of the academy at Sepphoris, and formed the *Mishnah*, a word literally meaning "teaching," and applied to the laws and regulations. At Tiberias the foundations were laid by Johanan ben Nappaha (A.D. 189–279), the founder of the academy, for the work which was finally compiled in the fifth century as the Jerusalem *Gemara*, or supplement of the *Mishnah*, consisting of supplements, discussions, and elaborations of that work. The academy at Tiberias flourished with brief intervals to the time of Saadiah. The teachers at the academies bore different names at different periods; up to the compilation of the *Mishnah* they were known as *Tanaim* (teachers); during the development of the *Gemara* they were called *Amoraim* (speakers); later the name was *Saburaim* (examiners or investigators).

At the same time a parallel development was going on among the Babylonian Jews, where the academies became important about 219 A.D. Sora and Nehardea were the chief centers at first, but the place of the latter, on its destruction, was taken by Pumbeditha. At Sora originated the Babylonian *Gemara* under Ashi (d. 427). This work during its compilation was submitted treatise by treatise to the assemblies for discussion and criticism, until it was completed in the sixth century by the *Saburaim*. The Babylonian academy was called *Metibta* (meeting or session), or *Yeshibah*, the one being the Aramaic, the other the Hebrew name, and the head was called *Resh metibta* or *Rosh yeshibah*. At first the title of *Gaon* (Excellency) was given to the head of the academy at Sora, but was later bestowed on other eminent scholars. Sora was surpassed in importance in the eighth century by Pumbeditha, which continued successfully until it was brought to a close on the death of Hai Gaon (1038). An interesting institution connected with the Babylonian academies was the *Kallah*, a general assembly meeting twice each year, at the end of summer and winter, and not unlike the modern institutes or Chautauquas. A treatise, previously announced, was prepared by the disciples and discussed at the *Kallah*, the assembly being seated according to rank and a definite procedure being followed. All present were questioned individually by the president. In addition to the prescribed work, questions from all parts were discussed, and the answers were formulated by the president. And these questions came from wherever Jews had settled; for the Babylonian academies had during the Gaonic period (from the seventh century on) surpassed and taken the place of those in Palestine, and it was not until the tenth century, when Moses ben Chanoch, himself a student of Sora, founded an academy at Cordova, that the Western Jews became independent of the East.

The two compilations, the *Mishnah* and *Gemara*, dealing with the laws and regulations and the exegetical discussion that had grown up around them, were known as the *Talmud*, which for many centuries remained the storehouse of Jewish learning and the center of Jewish intellectual activity.

Educational Theories in the Talmud. — The theory of education in the nine centuries following the Old Testament period are to be found scattered in the Talmud. Education, meaning, as always, religious education, was regarded as the business of life. The ignorant man, the *Am haarez*, was to suffer civil disfranchisement and social ostracism, for the ignorant man cannot be religious, while "whoso knows the Bible, *Mishnah*, and morals will not sin easily." Hence the school was as much a requisite in every community as a synagogue, and to live where there was no school was forbidden. "The world exists by the breath of the children in the school." The importance thus attached to education explains also the reason why teachers were regarded as "the protectors" of a town. But the maintenance of schools was not a matter of importance to the individual alone, but also to the nation; and on these grounds the Patriarch in the fourth century sent two inspectors of schools up and down the country. The first and last duties of the father were to care for the education of his children, duties in which the mother also participated to some extent, and it was in the home that children first learned the meaning of the religious ceremonies and rites. The education of the child by the father began as soon as he could talk. In some communities infant schools (*Makri Dardeki*) were maintained, and received children at the age of five. Here the alphabet was taught, mainly through play and fanciful stories attached to each letter. But generally it was not considered wise for their future development to send children to school before the age of six, when they were admitted to the public schools, which were under the care of a publicly paid *Melamed Tinokoth* (teacher of children). But how intimate the relation between the home and the school was is evidenced by the fact that it was always the father, and not a slave, who took the child to school; while it was not unusual to supervise the work done at home. Great care was to be exercised in the selection of a teacher. The first qualification was an acquaintance with the whole store of learning. The teacher was to be married, not young, patient and wholly devoted to the needs of his pupils, for a dishonest teacher was regarded as "of those of whom it is said, 'Cursed be he who doeth the work of the Lord deceitfully.'" Teachers were exempt from taxation, and, although those in the lower grades were paid a salary, it was very general for the teachers of the Talmud to follow some vocation; so Rabbi Johanan was a shoemaker, Rabbi Simon a weaver, Rabbi Joseph a carpenter. The reverence with which teachers were regarded is reflected in their titles, "Lights of Israel," "Princes of the people," "Pillars of Israel"; and more respect and service were due to a teacher than even to a father, for "the father gives the son only temporal life, but the teacher helps him to obtain eternal bliss." Women could in no case be employed as teachers. Their sphere was the home. The pupils attended school morning and evening for five hours each day. The Sabbath and festivals were employed for review and examinations. Vacations were, accordingly, unknown, the only concession being a reduction of one hour a day during the heat of summer.

A well-defined school procedure came to be recognized, and a traditional curriculum was early established. The school age (five or six to fifteen) was divided into three periods — one devoted to the Scriptures, one to *Mishnah*, and one to *Gemara*. At thirteen boys were confirmed and attained their religious majority. The subjects mentioned formed but the core of the studies; the extent and scope has been described above in dealing with the development of the Talmud. The method, as usual with oriental peoples, and as is to be expected from the lack of written material, was wholly oral. The teachers, however, frequently wrote out sections for their pupils to read. The pupils sat on the ground or on benches around the teacher, and repeated their tasks aloud and articulately, for "to speak aloud the sentence which is being learned fixes it in the memory." Since so much of the work was a matter of memorization, numerous mnemonic devices were introduced. Among these may be mentioned acrostics, the arrangement of sentences in alphabetical order; the alphabet itself was learned in different arrangements forward, backward, grouping by twos taken from each end (a system borrowed from the Greek, *e.g.* αω, βψ); numerical symbols were also used. But above all stress was laid on repetition, and teachers were recommended to repeat with their pupils until they mastered a subject thoroughly. Wholesale reviews and revisions were frequent in order to fixate the larger topics. At the same time it was not desired so much that the amount of information imparted should be great, as that a pupil should become the master of what he knew, and if a pupil failed to comprehend, the charge was laid to the teacher. But diligence and industry were expected from the pupils, and he who said, "I have taken pains and acquired nothing," was not to be believed. The pupil was expected to ask questions, for "whoso is ashamed to question, learns nothing," and again "one who is bashful cannot be learned." Of classroom devices to stimulate the pupil there was no lack, emulation and rivalry being the chief of these. Sweetmeats and cakes, on which were inscribed words or whole sentences, were given to the younger pupils for good progress, while corporal punishment with a strap was inflicted for misbehavior or laziness. Older pupils were reprimanded or rebuked for breaches of discipline. On the whole, while teachers were expected to be stern, a certain degree of respectful intimacy between them and their pupils was recommended. The honor of a pupil was to be as dear to a teacher as his own. Mutual instruction and the instruction of backward children by an older boy, usually the head of his class (*Resh Duchna*), was a well recognized principle. In this way the teachers were relieved where classes were large, and a new stimulus was added, for "as a small chip of wood sets fire to a large one, so the younger pupils sharpen the older, or just as steel whets steel, so is one scholar sharpened by another," a principle which was rediscovered by the Jesuits. Further, intercourse with the learned was enjoined, since "even the ordinary conversation of the wise is instructive," or, as Rabelais puts it, "haunt the company of learned men."

The Talmud divides students into four categories, which "correspond respectively to a sponge, a funnel, a strainer, and a sieve," and develops the analogies. In another passage, which deserves quotation, it is stated that "four characteristics are found among the disciples. The first quickly comprehends and quickly forgets; such an one loses more than he gains. The second with difficulty comprehends, but does not readily forget; he gains more than he loses. He who comprehends quickly, but does not easily forget, has a goodly portion. He who slowly comprehends and forgets quickly has an evil portion." How the psychology of memory was developed has already been described. The connection between knowledge and conduct was emphasized, and the value of the impressions gained was measured by the expression in behavior. "Great is the study of the law, for it leads to action," and again "Not theory but practice is the important thing." And if the value of knowledge lay in its use, not the least service of the learned man was to teach others.

Intellectual training did not complete the education of children. Vocational preparation was not neglected, and this duty was enjoined on the father as much in the interest of society as of the individual, for "whosoever does not teach his son a handicraft, teaches him to be a thief," and again "learning, no matter of what kind, if unaccompanied by a trade, ends in nothing and leads to sin." That "labor honors the laborer" has been shown by reference to the many scholars who were humble artisans. Fathers were also charged with the duty of the physical training of their children in so far as they were advised to teach them swimming.

Such was the educational tradition established by the Talmud. Modifications were made, but the spirit remained unchanged up to the present day. While there is some danger in attempting to read into the system what is not to be found therein, there is as little justification for dismissing, as some German writers have done, the educational theory of the Talmud as entirely valueless, because it did not have any historical influence. The reason for this, however, does not lie with the system, but in the fact that no trouble was ever taken to learn from a people which was regarded with contempt.

Middle Ages. — *Spain.* — Few nations have responded so readily to external conditions as have the Jews; so in cosmopolitan Spain of the early Middle Ages their intellectual interests were as broad as the field of knowledge, and resulted in a profound influence on European thought; in Italy they showed the same light-heartedness, the same worldly spirit as their neighbors; while in Germany there is noticeable that strong moral and religious atmosphere, mystical in tendency, which marked the Teutonic people.

For three centuries (sixth to ninth) there had been intellectual stagnation until the admission of Arabic influences gave rise to a new development, and a revived attention to the Talmud from a new point of view. Philosophy was called in to the support of the national religion. There arose an army of scholars, grammarians, astronomers, historians, philosophers, and poets, and with the new studies came a renewed interest in the education of children, and the formulation of educational theory to meet the new requirements. The educational ideals of the time (from the tenth to the thirteenth centuries) are indicated in letters, wills, and monographs. The best illustration of these is the will of Jehuda ibn Tibbon (1120-1190), a doctor and translator of philosophical and grammatical works. He had provided his son with a well-stocked library, with several editions of each book, and had engaged a teacher for him in secular subjects; the son is advised to study Arabic and Hebrew, orthography, grammar, and style, religion and medicine; he is to learn by teaching; to take pride in his library and be ready to spread knowledge by lending books willingly (the last recommendation is repeated frequently in other works of a similar nature as an act of piety). The highest point in the development of Hebrew-Arabic culture was reached in the time of Maimonides (*q.v.*), who attempted to reconcile Platonic philosophy with the Hebrew religion in the *Moreh Nebukim* (Guide of the Perplexed), which with his Codex of the

Talmud exercised a great influence on Hebrew study. Works on method of instruction and programs of study are now frequently met with, either original or based on Arabic sources. So Jehuda Charisi in the *Moral Sayings of the Philosophers* recommends ten subjects for a ten-year course: writing, grammar, and prosody, law or religion, arithmetic, mathematics, astronomy, medicine, music, logic, philosophy. These studies, however, always presupposed the Talmud and the Bible, which indeed formed a foundation. The best exposition of the ideas of the time is found in the *Healing of the Souls* by R. Joseph b. Jehuda Aknin of Barcelona (end of twelfth century). It is clear from this work that, as in Europe generally, so among the Jews, the influence of Aristotle led to an encyclopedic study. Numerous encyclopedias were written or translated in the twelfth and thirteenth centuries. Aknin's curriculum included reading and writing, the Pentateuch and *Mishnah*, grammar and poetry (carefully selected for its influence on character), Talmud, which must be memorized and thoroughly understood before proceeding to philosophy, including mathematics, natural science, and metaphysics. Philosophy is to be studied as a defense against heresy and for the prevention of error. Logic, dialectic, rhetoric, and poetics find a place, and Aristotle is the textbook. Mathematics includes geometry, astronomy, optics, music, and mechanics. Under natural science come medicine and the eight divisions given in Aristotle's *Physics*. Each study is justified on Biblical authority. No better description of the qualities of a teacher can be found than those given by Aknin. He must have full knowledge of his subject and critical ability; and knowledge must be the mainspring of conduct; he must treat his pupils as his sons and through knowledge lead them to right conduct; he must teach step by step according to the ability of his pupils, and teach them that learning is its own reward. The pupil must respect his teacher more than his parents; he must be ready to ask questions; he must let nothing distract him from his studies; beginning with the first principles, he must leave no point in his course unsolved; and he must leave his home to find the best teachers and the soundest learning. It is not necessary here to point out the analogies between the attitude toward philosophy and the curriculum here described, and the seven liberal arts and the aim of philosophical study in the scholastic period.

The change in political conditions, the expulsion of the Arabs, and the persecutions under Christian rule, combined with internal disputes, led to a decline in Jewish studies. In many places the rabbis forbade the study of philosophy at about the same time as the works of Aristotle were burned at Paris. Mysticism on one side or rationalism on the other, with a consequent contempt for religious prescriptions, took the place of a study of philosophical foundations. It even became a matter of pride to admit ignorance of the sciences. Attempts were made here and there to revive secular learning, as by R. Jehuda b. Samuel b. Abbas (*Jair Natib*, or *Light of the Way*, *c.* 1250), by Schemtob b. Joseph Falaquera (*c.* 1290), by Abraham ibn Chasdai (*c.* 1250), but with little avail. The reaction was complete in non-Arabic Spain and the Provence. While the study of philosophy was forbidden because it led to contempt for religion, justification for it was sought, as by Joseph Kaspi of Argentières (*c.* 1322), by claiming Hebrew origin for Aristotle's works and reading into them commands to fulfill the words of the Hebrew teachers and prophets. As with scholasticism, so with Hebrew studies; ignorance began to cover its defects by disputations, by quibbling, and by strawsplitting; the spirit of the law was forgotten in a mass of petty details, novels, and commentaries. By 1350 Profiat Duran of Catalonia, although he himself had enjoyed a broad education, felt that the only way out of the confusion which had been wrought was a return to the traditional Hebrew curriculum. Hence his grammar (*Maase Efod*), which contains a number of pedagogic principles, omits all mention of secular studies.

As a general rule children received their education from private tutors, although every community maintained one or two public teachers. The practice of receiving payment for teaching became common in the twelfth century, as it was more and more impossible to combine a trade with the professional work. Maimonides rebukes teachers for receiving pay and scholars for accepting stipends and board. The teachers were always exempt from taxation. Instruction began at three or four, the child being introduced to his studies with ceremonials. Discipline as a rule was mild, rebukes being preferred to corporal punishment; fruit, clothing, and toys were used to stimulate the future scholar. While girls were excluded from schools, they learned the Hebrew language and prayers. Higher studies were pursued in the academies or public schoolhouses of the rabbis, the synagogues being also used. It became a matter of distinction for wealthy men to maintain academies at their expense, as it was also to possess a library and to be willing to lend books. The young men wandered from academy to academy in search of knowledge, many going as far east as Palestine and Babylon.

Northern Europe. — The Jews were long settled in the north of France and in the Rhine districts, their settlement having been encouraged by Charlemagne, who himself employed Jewish physicians and ambassadors. For several centuries they were allowed to live undisturbed and maintained friendly relations with their neighbors, as may be indicated in

France by the numerous fables (*Contes et Fabliaux*), both original and translations from the French, and in Germany by the use of the vernacular and the many popular translations or transcriptions into Jewish German dialect, while the troubadour, Süsskind von Trimberg, could hardly have been an isolated instance of the part played by Jews in the literature of the homes of their adoption. The Crusaders, ecclesiastical decrees (*e.g.* that of Archbishop Odo of Paris, 1197), and the Black Death tended to destroy these relations, and the persecutions and intolerance broke up the Jewish homes and drove them to other settlements. Removed as they were from the Arabic influences, the northern Jews tended to remain largely in the traditional groove of intellectual activity, — collecting, editing, and commenting on the Bible, the Talmud, and other exegetical works. Epoch-marking was the work of R. Solomon b. Isaac, better known as Rashi of Troyes (1039–1105), whose summary, written in a simple, natural style, served as a useful school textbook to introduce students to the commentaries. This work was also used by Christians, so by Nicholas de Lyra, called the ape of Rashi, and by Luther.

The aim of Hebrew study at this time was to relate the Talmud to the changed conditions of life, and so new decisions and ordinances (*Tossafot* and *Tekanot*) were issued. While there is little on educational theory at this time, practice hardly differed from that among Jews elsewhere. The child was entered at school or with a teacher at Pentecost with a ceremony in the synagogue, and the teacher at once gave him his first lesson on the alphabet from a tablet smeared over with honey to denote the sweetness of learning; a cake, inscribed with several Biblical verses, was given to the young scholar; there were also other symbolical ceremonies. The curriculum differed but little from the traditional Bible, *Mishnah*, and Talmud, and Rashi. When the pupil had gone through these studies, it was usual to wander round to other teachers to learn the latest and most authoritative decisions and supplements (*Tossafot*); and many communities established houses of learning or academies (*Beth hamidrash*), and often provided board and lodging for wandering students.

It was in the north, and especially Germany, that the wandering spirit attained its greatest development among Jewish as well as Gentile students. The former (the *Talmud-bahur*) was more fortunate than his brother, for regular provision was made either in the *Yeshibah*, or academies, or in private houses for their reception and entertainment. But they suffered much privation and want in spite of this. The chief desire which inspired the wanderers was to hear some new explanation, some new decision. These scholars performed a service by making copies of, or in some cases stealing, works and thus circulating them, and by spreading the new decisions and thus subjecting them to thorough criticism. It is not surprising that in time the value attached to "novels" led to hairsplitting disputations for their own sake and neglect and ignorance of the Bible and Talmud, features for which analogies can easily be found in later scholasticism.

An extremely interesting type of educational literature was produced by the northern rabbis which finds its analogy in the contemporary Books of Virtue, of Manners, and of Etiquette. But the distinguishing mark of the Jewish works is that they were addressed to the masses, while the chivalric books were intended for the gentry and noble. At a time when the canons of chivalry make almost no mention of learning, the *Conduct of Life*, contained in the will of R. Elieser of Worms (*c.* 1050) addressed to his son, emphasizes the importance of knowledge and piety; respect for learning and reverence for the teacher; intercourse with the wise; upright dealings with his neighbors of all religions; kindness to those in trouble and charity to the poor; and does not omit to give practical hints on hygiene and diet. Similarly R. Elasar of Worms (d. 1298) urges piety and humility, observance and knowledge of the Law, uprightness and love of neighbors, self-denial and kindness to the needy, constant study, and care for the education of children. The most complete work of this type is the *Book of the Pious*, attributed to R. Jehuda Chassid, a mystic of the thirteenth century. Here are emphasized neighborly love; upright dealings; kindly treatment of inferiors and animals; true piety and charity; education of children, boys by teachers and girls by their parents; separation of good and bad children, of bright and weak pupils; readiness to lend books and manuscripts; reverence for and care of sacred books. How the tradition was maintained is indicated in the *Book of the Pious* (called the "short" to distinguish it from the earlier work) of R. Moses Kohen b. Elasar of Coblenz (*c.* 1473), and in the anonymous *Book of Morals* (*c.* 1400), which was translated into the Jargon in 1542. While both works repeat the emphasis on the qualities already mentioned, there are additions on table manners and etiquette in daily intercourse. Works of a similar character are found frequently throughout the sixteenth and seventeenth centuries, adequate testimony to the perennial interest in education.

Hebrew Influence in Middle Ages. — In the early part of the period under consideration, that is, about the ninth and tenth centuries, Jew and Christian lived amicably side by side. Synagogal and church melodies were exchanged, and many Christian scholars used Hebrew words an commentaries. There was an interchange of thought on religious questions, and disputations appear to have been frequently engaged in. Alcuin refers to a disputation at Pavia about 800 between a Jew, Julias, and Peter of Pisa. In the tenth century Ratherius, Bishop of Verona, defends his anti-Jewish attitude on the ground that the Jews were too outspoken in disputing with Christian theologians. The traditional training of the Jews afforded them a preparation for disputative argument which frequently led them to victory. Indeed, such was the confidence in their powers, that they were often the challengers. It is not surprising, then, to find that toward the end of the twelfth century the Church began by forbidding laymen to enter into theological discussion with Jews, and soon forbade such intercourse even to the somewhat better educated clergy. On their side, the Jewish rabbis used their influence to prevent such disputations when the era of persecution began. (Cf. *Book of the Pious.*) The friendly relations which existed between Jews and Christians not only led to disputations, but many of the clergy seized the opportunity to learn Hebrew from their Jewish friends, and there appears to have been an interchange of church and synagogal melodies. But the Church put an end to such tendencies to tolerance, holding *quorum dispar est cultus, nullus debet esse animorum consensus.*

In two fields of study — medicine and astronomy — the Jews of the Middle Ages were preëminent, and their influence is strongly marked. The profession of medicine was almost wholly in their hands from the ninth to the thirteenth centuries. At Salerno there were in the early beginnings many Jewish teachers, and Hebrew was one of the languages in which lectures were delivered. The first medical encyclopedia (*Compendium Salernitanum*) was composed by Copho, who is thought to have been a Jew. From Salerno the Jewish doctors spread throughout Italy and held many important positions in ecclesiastical and secular courts, *e.g.* Farragut and Charlemagne, Zedekia and Charles the Bold. The *Canon* of Avicenna was first made accessible by a translation into Hebrew; and a commentary on Hippocrates was written in the thirteenth century by Abraham Cabrit. At Montpellier a Jewish medical school, the forerunner of the later university, was opened about 1025; and later, many Jews were connected with the medical faculty as teachers and as deans, until a ban went out in the thirteenth century against Jewish doctors.

In astronomy the Jews were active practically and theoretically. They made several astronomical tables, *e.g.* the Toledo tables in 1080, and the Alfonsine tables under the superintendence of Isaac ben Sid. Levi Gerson (Leo de Bagnolas) invented an astronomical instrument, and his work upon this was translated into Latin by order of Clement VI, and was highly appreciated by Kepler. As translators of Arabic astronomical works the Jews made accessible the most valuable studies in the field. Ibn Ezra (*q.v.*) translated the *Canons of the Khowarezmi Tables* of Al-Mattani; Moses ibn Tibbon the work on the Ptolemaic system by Jahir ben Aflah; Jacob Anatoli translated Ptolemy's *Almagest* and Averroës' compendium on this work. Profiat Tibbon was professor of astronomy at Montpellier. In the field which was then so nearly allied to astronomy — astrology — the interpretations of the Jews were much sought after, until they were forbidden by the rabbis as likely to lead to trouble.

In philosophy the Jews exercised an influence for which they have only received scant credit. Interested as they were mainly in reconciling Hebrew theology with philosophical speculation, their work fell directly into line with the aims of the early scholastics, and few of the leading medieval theologians failed to show a knowledge of Hebrew philosophical writings. While it is true that the Jews served mainly as intermediaries between Greek and Arabic philosophy on the one side and Christian theology on the other, without this mediation the development of scholasticism would have been retarded for many years until a direct knowledge of Aristotle would have been possible. The first Hebrew philosopher to exercise a marked influence on Christian philosophy was the Neoplatonist, Ibn Gabirol or Avicebron (1021–1058), possibly because he was not known for several centuries as a Jew. Ibn Gabirol's *Fons Vitæ*, translated into Latin at Toledo, *c.* 1150, served as a text-book of Neoplatonism, and was known by Duns Scotus, Albertus Magnus, Aquinas, William of Auvergne, and Alexander of Hales. The work was a matter in dispute between the Franciscans as represented by Duns Scotus and the Dominicans, represented by Albertus Magnus and Aquinas. Duns Scotus was a stanch upholder of Avicebron, and accepted his theory of the universality of matter, and the emanation of the divine will. The latter view was also accepted by Albertus Magnus, who devotes some space in the *De Causis et Processu Universitatis* to a consideration of Avicebron's views. But the most permanent and broadest influence was exercised by Maimonides (Moses ben Maimon, d. 1204) (*q.v.*) through the Aristotelian *Moreh Nebukim* (*Guide of the Perplexed*), translated into Latin within fifty years of his death. He is quoted freely by Albertus Magnus as Moyses Ægyptus, and his work as *Dux Neutrorum.* The *Moreh Nebukim* is an attempt to reconcile revealed religion and rationalism or Aristotelianism. Albertus accepts Maimonides' theory of the creation, and, as against Aristotle, his arguments against the eternity of the world. Albert's *De Divinatione* is largely based on Maimonides, especially the distinction between visions, dreams, and prophecy. Where Albert differs from his authority, it is purely on doctrinal grounds. Thomas Aquinas is even more indebted to Maimonides, whose views he reproduces almost verbatim. He accepts the proofs of God's existence, the theory of the creation, and the views on the eternity of the world, on God's omniscience, and on angels as intelligences or emanations of God. These instances will perhaps suffice in a brief account, but many others could be cited, — Isaac Israeli, for example, whom Albertus Magnus regarded as the greatest philosopher after Maimonides; David (possibly the same as Ibn Daud or Johannes Hispalensis), whose *De Causis* he quotes; Andrea (or Anatoli), who assisted Michael Scot, according to Roger Bacon; Levi ben Gerson, the astronomer and commentator on Averroës' Aristotelian commentaries, who exercised some influence on Pico del Mirandola. Many other Hebrew writers could probably be discovered on investigation, for it was a custom of medieval writers to quote without citing authorities.

The greatest contribution of the Jews to the development of medieval civilization was made by their activity as translators. The Jews by the conditions imposed on them were necessarily polyglot. They readily adopted the vernacular of the countries which afforded them a home. How catholic were their interests may be seen by a glance at Steinschneider's *Hebraische Übersetzungen des Mittelalters.* They entered every field of human knowledge which was accessible to them. Their translations into Hebrew were made from Latin, Arabic, Spanish, and other languages. With many the impulse was purely intellectual; others were professional translators in the pay of patrons, of whom Alfonso X, Frederick II, Charles of Anjou, Robert of Anjou, and Don Pedro are the most notable. There were two methods by which otherwise inaccessible works found their way into the hands of Christian scholars, — most usually the Jewish secretaries translated into the vernacular, and this was in turn translated into Latin, or else they themselves translated directly into Latin. One of the most famous centers for translation, especially from Arabic, was established by Raymond, Archbishop of Toledo (1130–1150), who was assisted by Gundisalvi. The chief translator was Johannes Hispalensis, or Avendeath (*i.e.* Ibn Daud), a Jewish convert, who translated mainly Arabic astrological and astronomical works and some philosophy. He compiled an *Epitome Totius Astrologiæ*, probably from Arabic. Among other works translated under Gundisalvi with the same assistance were Avicenna's *Physics*, in which another Jew, Solomon, collaborated; *De Anima; Metaphysics; De Cœlo et Mundo; De Ortu Scientiarum;* the *Khowarezmi* of Mohammed ben Musa; some works of Maschallah, an astronomer. Other interpreters were Abraham bar Chijja, the astronomer, who probably assisted Plato of Tivoli in the translation of his *Liber Embadorum*, a work on geometry, and possibly in translations of his astrological aphorisms, taken from the Arabic. Chajjim (*c.* 1250) translated astrological works of Ibn Ezra into French, and assisted Henricus Bates and several others with Latin translations. In the service of Alfonso X, were Isaac ibn Sid (Rabbi Zag), who translated into Spanish several Arabic works on astronomical instruments and assisted in drawing up the Alfonsine Tables; Abraham Alfaguin, who translated part of the Koran; Judah b. Astruc compiled a *Book of Sentences* in Catalonian dialect from Arabic, Hebrew, Greek, and Latin, a work intended for the education of the nobles; Judah b. Moses translated Arabic astronomical works into Spanish, *e.g.* Costa b. Luka's *Globe*, and also a *Lapidarium* of Abolays. Charles of Anjou employed Moses Farachi or Faradj, translator of the medical work *Continens* of Razi, Pseudo-Galen, *De Medicinis expertis* from the Arabic of Hunain, and a medical dictionary of Abu Ali ibn Djazla (*Tacuynum ægritudinum et morborum corporis*); Moses of Palermo was taught Latin at the request of Charles for purposes of translation, and translated from Arabic Pseudo-Hippocrates' *Lib. de Curationibus Infirmitatum Equorum.* Kalonymus b. Kalonymus translated for Robert of Anjou, among other works mathematical and medical, many of Averroës' Aristotelian commentaries, *e.g. Topics, Sophisms, Analytics, Plants.* It would be impossible here to enumerate the number of independent translators and interpreters or to do more than indicate those who made Arabic works accessible through translations into Hebrew. Of these the most famous were the members of the family of Ibn Tibbon, who settled in the south of France about the middle of the twelfth century; Judah ibn Tibbon, the father of translators (1120–1190); Samuel (1150–1230), the translator of Maimonides; Moses (fl. 1240–1280), the translator of Averroës, Euclid, and Avicenna; Jacob b. Machir (Profatius Judæus, 1236–1304), the translator of Euclid, Averroës, Kosta ben Luka, and the *Almagest.* Jacob b. Abba Mari (Anatoli), a son-in-law of Samuel ibn Tibbon, was retained as translator by Emperor Frederick II, and collaborated with Michael Scot. Direct translations into Latin by Jewish scholars do not appear in any number until the fifteenth century, and among these may be mentioned the works of Elias Del Medigo (whose patron was Pico del Mirandola), Abraham de Balmes, Kalonymus ben Judah, Jacob Mantino, and Moses Alatino. From the end of this century on, the knowledge of Hebrew was sufficiently widespread for independent translations by Christian scholars.

End of Medieval and Beginning of Modern Period. — In France the period of Jewish development came to a close with the persecutions which ushered in the thirteenth century. A decline had already begun to set in as a result of the disputes centering round Maimonides' philosophy and this was completed when the Talmud was burned at Paris in 1242, and the Jewish academies were closely watched. That some attempt was made to stem the decline is indicated in a remarkable school statute of the thirteenth century, of which three different versions exist. A school organization is projected from top to bottom. A "petty school" was to be established under a superintendent of studies and teachers who were to have only ten pupils of selected ability under their charge. Books were to be used instead of the oral method, and translation into the vernacular was to be employed. Pupils should be encouraged to hear each other every night for mutual improvement. Weekly, monthly, and half yearly reviews were to be conducted by the teachers. In the capitals an academy or "great school" was to be maintained at public expense, to which the "separated" or oblates, *i.e.* the firstborn male children, were to proceed at the age of sixteen; the lecture system was to be employed here and tutors were to be appointed to conduct "quizzes." The whole course in both schools was to last fourteen years, beginning with the fifth or sixth year. While there is no evidence of such a system in practice in France, it is possible that it may haye existed in England, for there appears to have been a small provincial school at Norwich and a great school (*Magna schola Judæorum*) in London. For this reason an English origin is assumed for the code (see J. Jacobs, *Jews of Angevin England*, p. 342).

The education of girls was not encouraged, for "education leads woman to error." She was to be educated for the home, and in any case the custom of early marriage precluded an education beyond a knowledge of the faith and ritual necessary for the home. Many women conducted businesses, while their husbands traveled for study; many encouraged learning by loan of books, and by helping poor students with board and lodging; some, however, did themselves attain considerable knowledge of religious traditions.

In Germany and Poland, however, the medieval system began to be stereotyped, and when the sixteenth century is reached the traditional Jewish educational institutions are firmly established. The center of Jewish learning, however, tended to move to Poland, where the German Jews gradually settled in large numbers. The institutions are (1) the *Heder* or *Talmud Torah*, giving instruction up to the age of fourteen or even sixteen, and (2) the *Yeshibah*, or rabbinical academy. The *Heder* (lit. "room") was a private school in which pupils paid tuition fees. The teacher (*Melammed*), not always a competent scholar, frequently taught in the one room of his house, in the midst of his family, while he continued his occupation or business, if he had one. Sometimes he would have the aid of an assistant (*Belfer* or *Behelfer*) who brought the pupils to and from school and taught the elements. Since the number of pupils was small and they varied in age, class instruction was generally impossible, much to the detriment of a consistent curriculum. Among defects of the *Hedarim* in the seventeenth century are also mentioned the bitter competition between teachers, frequent changes of schools, dishonest practices to retain pupils, inadequate accommodations, etc. (Moses ben Ahron, 1635). An interesting statute was passed by the community at Nikolsburg in Moravia to remove these and other abuses (1676; revived 1726). A board of education was also established at Frankfort in 1662. The conditions of the *Heder* remained unchanged up to the present day, although some attempt is everywhere being made to improve them.

The *Talmud Torah* was originally a communal school for poor and orphan children. Toward the beginning of the sixteenth century Talmud Torah societies are found in most of the Jewish settlements in northern Europe; elsewhere communal boards of education were elected (*e.g.* Posen, Worms). In both cases schools were maintained by fees, by voluntary contributions, by a share of the contributions to synagogues, by collections made at circumcisions, marriages, and funerals, and by charity. In Cracow the Talmud Torah Society supervised both private and public schools, and weekly inspections of instruction were made (see Statutes 1551–1639). But although more rigorously supervised, the Talmud Torahs were not much superior to the *Hedarim*.

The curriculum in both types of schools was the same. From the age of two or three children were taught a few prayers and benedictions at home, and were introduced to the ceremonials. Entering school at the age of five, they were taught the alphabet, benedictions, the daily prayers (*Sidur*), the Pentateuch with translations into the vernacular, the rest of the Bible, exegesis (Rashi and other commentaries), and Talmud. Reading and writing in the vernacular, Hebrew grammar, and arithmetic were also taught in some schools. But the main emphasis was on religious instruction and practice. Toward the thirteenth year, the time of initiation, when the boys became legally members of the community (*Bar-mitzvah*), they were instructed in the laying of the Phylacteries (*Tefillin*). The method of instruction throughout was oral, and the traditional mnemonic devices and numerous reviews were employed. If a boy proved intellectually dull at fourteen, he was put to a trade, apprenticeship fees being paid by the community or societies for the poor. Those who had the ability entered the *Yeshibah*, the public academy under the charge of the rabbi.

Academies were to be found in all large towns; in Spain and the south of France they provided, as was shown above, a broad university education. In Germany and Poland all energy was devoted to rabbinical studies, and all profane or vernacular works were rigorously forbidden. The course of study consisted of the numerous commentaries and exegetical writings on the Scriptures, *Mishnah*, and Talmud. The chief of these were the *Halakot* (an abridgment of the Talmud) by Isaac ben Jacob Alfasi (d. in Spain in the eleventh century); the *Turim* (a compilation of the codes, omitting those parts which were obsolete) of Jacob ben Asher (1340); and later the *Shulhan 'Aruk* (code on ritual and legal questions) of Joseph Caro (b. 1488). One part of the course was given to private study of *Gemara*, Rashi, and *Tossafot* (the glosses on the Talmud which were begun after Rashi). The students prepared questions on their readings, which were discussed by the Rabbi at the next meeting. Another part of the course was devoted to scholastic disputation to clarify any difficulties or contradictions in the codes. This method of disputation (*Pilpul*) tended to become an end in itself, and led to subtleties and quibbling, but it demanded a ready knowledge of the fundamental codes and commentaries. Learning was greatly esteemed, and the learned man was given the place of honor wherever he came. Boys of promise were eagerly sought in matrimony, and wealthy fathers willingly provided maintenance for learned sons-in-law.

Modern Period. — These forms of education have in part continued up to the present time, more especially among the Russian and east European Jews. The emancipation of the Jews dates from the time of Moses Mendelssohn (1729–1786), who realized that their further progress depended upon their restoration to the normal conditions of social life. The vernacular which the secluded Jews spoke through centuries of isolation must yield to the national language of their German environment. In order to bring about this change, Mendelssohn translated the Bible into German, knowing that the acquisition of the language of their adopted country would be a right beginning toward the reformation, and that the Bible, always a household book among the Jews, would be the most effective means for the purpose. Never was a people so serious and so passionate and so ideal in the pursuit of an education. Ten or twenty years sufficed to make a remarkable change. The dilettantes, who had preoccupied the schools and whose want of understanding of both their obligation and their opportunity had been in a large measure the cause of the decadence, disappeared, and schools arose in several places, patterned after the best models, such as the Philanthropin of Basedow (*q.v.*) in Dessau. Among these may be mentioned the Samson'sche Freischule at Wolfenbüttel, the Freischule of Berlin, the Philanthropin of Frankfort a. M the Freischule in Seesen, and a large number of congregational schools all over the land. The Freischule of Berlin was organized on the plan of David Friedländer, the friend of Moses Mendelssohn, in 1778. When, in 1774, J. J. Basedow opened the Philanthropin, Mendelssohn urged that the Jews encourage the undertaking, and a brother of H. Wessely came to its support and enlisted a number of Jewish families for its patronage. But although the experiment failed, the Jews of Dessau, in the light of the experience and the interest in educational matters which it stirred, undertook to establish a school which should secure for the Jews the influences and the enlightenment so vividly desired by them. At first a school for poor Jewish children, it soon became a communal school receiving even non-Jewish children. This school was known as the Jewish Central and Free School (*Jüdische Haupt- und Freischule*), and later the Duke Francis School (*Herzogliche Franzschule*); its principal was David Fraenkel.

Noteworthy schools of this period are the school of Seesen, founded by the reformer Israel Jakobson in 1801; the school at Breslau established by Joel Loewe, a pupil of Moses Mendelssohn, in 1791; the Samson'sche Freischule at Wolfenbüttel, which graduated such eminent pupils as Leopold Zunz, the bibliographer, and J. M. Jost, the historian; and the Philanthropin at Frankfort a. M., which was established in 1805. Some of these schools are still in operation, though their method of instruction and their aims have been modified by the changed conditions and the modern conceptions of pedagogy

In Austria, by the Edict of Tolerance issued by Emperor Joseph II (Oct. 29, 1781), Jews were permitted to establish schools of equal standing with those of Christians. It was the purpose of the " Toleration " to enable the Jews in the Austrian Empire to speak the prevailing language and to enter into the trades. The results of this liberal policy were not slow to appear. The Jewish educational institutions were organized by Herz Homberg in 1818, who was supported in his labors for the uplift of the Jews by the wise and persistent policy of the government. The training of teachers was provided for at the very beginning of the movement for the reform of Jewish education. The Pedagogical Seminary at Cassel was established in 1809, and the one in Berlin, founded in 1840, was under the direction of Leopold Zunz. There are also seminaries at Münster and Hannover. The aim is to equip the teachers of the Jewish communal and congregational schools in a manner comporting with the modern requirements.

In England secular institutions were not established until the beginning of the nineteenth century. Talmud Torahs and religious schools probably existed earlier. In 1811 the Westminster Jews' Free School was established, followed in 1817 by the Jews' Free School in Whitechapel, now one of the largest elementary schools in the world. In the provinces, schools were not established until some years later; the Jews' Free School at Manchester and the Hebrew School in Liverpool were both established in 1842. In 1851 the Jewish schools were allowed to share in the national grant to education. The subsequent history of the Jewish schools has been the same as that of other denominations voluntary or non-provided schools. (See ENGLAND, EDUCATION IN.)

Jewish secular schools have not been numerous in the United States. Schools were early attached to synagogues and taught both religious and secular subjects. Hebrew schools were established in New York in 1808 by the Sheareth Israel. In Philadelphia a general Sunday school, not affiliated to any synagogue, was established in 1838, followed in the same year by one at Charleston, S.C., at Richmond, Va., in 1839, in New York in 1845 by the Emanuel Society. In 1864 a Hebrew Free School Association was established, in which the children were brought together irrespective of their synagogue affiliation and were taught by voluntary teachers. The rapid increase of immigration immediately raised a complicated problem, the extent of which has only recently been realized and which is only just being faced.

The Present Problem. — The problem of purely Jewish education is becoming more and more difficult and complex in proportion as the facilities for secular education increase. In Russia and eastern Europe many of the types of schools referred to above, the Heder, the Talmud Torah, the Yeshibah, still play a significant and important part in the lives of the people; in Russia these schools also provide the secular education which is denied the Jews by the government authorities. But it is in the countries where freedom has been greatest that the decline of Jewish teaching has been most rapid. The Jewish religion has always been essentially a religion of the home; many of the ceremonials only have meaning as they are performed in the home; the welcoming of the Sabbath, the close of the Sabbath, the celebration of the festivals, are occasions for the inculcation in a concrete manner of Jewish tenets and Jewish beliefs in the minds of the young. The growing economic independence of children, and frequently the difference in outlook, due to difference in language and education, are tending to break down the home bonds and home life which have been at the root of Jewish life. This, however, is only one of many causes. On the side of the Jewish schools for the purely sectarian and religious education, little has been done to keep pace with the advance in educational thought and practice. The methods are still in the majority of instances the methods of the medieval period. Cramming and memory work without appeal to the understanding too often tend to arouse a rebellious spirit. On the material side, too, the schoolroom, especially the Heder, is too often an unsanitary room used for most other purposes of life beside teaching; the teacher, however learned he may be, in most instances takes up his work as a *pis aller*. Class instruction is unknown in the Heder, and the boys take their lessons in turn for a few minutes at a time. The visiting Hebrew teacher (*Melammed*) is professionally of the same type as the master of a Heder; his presence is unwelcome, his methods as unmethodical, and his remuneration as miserable as of the Heder teacher. Of a higher type are the communal Talmud Torahs, which alone may hope to cope with the problem. They are housed in modern school buildings, they provide a consistent curriculum, and the beginnings are being made to train teachers for the work. Class work takes the place of individual and random tuition. - Above all, instruction is given in the vernacular (English or German) and not in the Yiddish jargon. At present these schools have a struggling existence, since they are dependent to a large extent on voluntary contributions and fees. The curriculum generally includes elementary Hebrew, the Daily Prayers, the Pentateuch, the principles of Jewish faith and practice, and with more advanced students other parts of the Bible and simple commentaries. But even the Jewish parents who are anxious to educate their children in many cases have only the confirmation (at the age of thirteen) in view; after that time, when the boy is able to read his portion of the Law and to lay the Phylacteries, little further attention is paid to his education. As for the girls, their education is almost entirely neglected and rarely goes beyond ability to read and a knowledge of Jewish faith and practice. This problem is one of the most difficult which Jewish educators will have to face. Traditionally the home has always provided for the education of girls. The decay of the home, the early economic independence, the weak hold of the synagogue, the so-called attractions of the street contain in them the causes of many a tragedy. The girls, it must be recognized, have as great a claim on the attention of the Jewish school as the boys.

One other type of school may be referred to, the congregational school, modeled on the Sunday school, maintained in connection with a synagogue and meeting on Saturday afternoon or Sunday morning and sometimes one other period in the week. Here the program is less ambitious and is confined to a little Hebrew reading, Biblical and post-Biblical history, the Jewish creed, and some singing. But too often the teachers are voluntary workers, the school has not the support of the parents, discipline is weak, and the pupils attend at will and drop out early. There is a tendency, too, in the congregational schools, more particularly in those connected with the reformed synagogues, to abandon entirely the teaching and study of Hebrew, since services are in any case conducted in the vernacular. In these schools the curriculum consists of

Biblical history, singing, and some discussions of Jewish creed and principles.

Much thought is being given to the question of Jewish education both in England and America. In London the Jewish Religious Education Board (est. 1894) has for a long time certificated teachers for Sunday school work, and in New York several well-conducted Talmud Torahs have sprung up which meet the best requirements of secular schools in material conditions, and the Kehillah (Community) has established a Bureau of Education under an efficient director to consider the whole question of reform in the direction of efficiency. Statistics have been obtained of the number of unsanitary schools (Hedarim), of teachers, salaries, funds, etc., and conferences have been held for the improvement of the curriculum. One other tendency which will contribute in large measure to some reform is the strong national or racial movement, an offspring of the Zionist movement, which, without raising any question of loyalty to the adopted country, aims to arouse an interest in the cultural side of Jewish history and Jewish life. With these proposals there is frequently connected the adoption of the new method of teaching Hebrew by the direct method (*'Ibrit be-'Ibrit*), with which much successful work has already been done. The reformed curriculum will, therefore, have an emotional as well as an intellectual aim; it will stimulate an appreciation in the best that has been, and by dissipating ignorance will remove much of the besetting sin of contempt and scoffing. I. L. K. and L. G.

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JOANNES DE GMUNDEN (c. 1380–1442). — The first professor of mathematics, as a separate subject, in Austria. He is also known as Johann von Gmunden, and Johannes de Gamundia, and the names Wissbier, Nyden, and Schindel, are also doubtfully assigned to him. He was born about 1380 at Gmunden on the Traunsee, Gemünd in Lower Austria, or Gemünd in Swabia. He died at Vienna, Feb. 23, 1442. He was educated at Vienna and was professor of mathematics there. He wrote a work on sexagesimal fractions (see Fractions), *Tractatus de Minucijs phisicis.*

D. E. S.

JOANNES DE MURIS. — A prominent writer on arithmetic, astronomy, and music. He was born in Normandy about 1310, and died after 1360. He is also known as Jean de Meurs (Murs, Muria). His *Arithmetica cōmunis* appeared in print in 1515. D. E. S.

JOHN, ABBOT OF ST. MARTIN'S. — See Biscop, Benedict.

JOHN B. STETSON UNIVERSITY, DELAND, FLA. — A coeducational institution founded in 1887; the present name was adopted in 1889. The university maintains an academy, college of liberal arts, college of law, a business college, a normal school, a school of mechanics arts, a music school, and a school of fine arts. The entrance requirements are equivalent to sixteen units. Candidates for the college of law which offers a two years' course must satisfy the faculty with evidence of their qualifications. The degrees of A.B., A.M., B.S., and LL.B., are given on the completion of appropriate courses. The faculty consists of forty-seven members.

JOHN OF DAMASCUS. — The founder of Greek scholasticism and the forerunner of the scholasticism of the West; was born in the latter part of the seventh century and died shortly before 574. He entered the cloister of St. Sabas at Jerusalem about 730, but even before that he had distinguished himself as a theological writer of ability. He spent two years of his noviciate at this monastery, and was ordained priest before 735 at Jerusalem. He spent the rest of his life almost entirely in his monastery of St. Sabas. His importance in the history of the Eastern Church rests upon his great dogmatic treatise in three parts, entitled by him the *Fountain of Knowledge,* his spirited defense of image worship, and his admirable hymns. Several of the latter are used in English translations by Neale; in the Eastern Church these compositions are of great liturgical importance. The importance of John in the history of education rests upon the use he makes of Greek philosophy in the first part of his *Fountain of Knowledge.* In this part, entitled Philosophical Chapters, later called *De Dialectica,* and intended to be introductory to theology, John establishes by practical use the principle that philosophy was to serve as the handmaid of theology or faith, a position which became a commonplace in Western theology and education in the Middle Ages, but was first stated and applied by John. With this conception of the relation of the two, he constructs a well-wrought-out methodology, based upon the categories of Aristotle and the universals of Porphyry's *Isagoge.* In this way the revived Aristotelianism, already strongly tinged with Platonism, became a part of the theology and theological training of the East. The *Fountain of Knowledge,* especially the first or philosophical part and the third or the Exposition of the Orthodox Faith, continued for many centuries to be the most important and the authoritative summary of the philosophy and theology of the Greek Church, taking a place as a basis of teaching more authoritative than even the *Sentences* of Peter Lombard in the West, or the *Summa* of St. Thomas in the modern schools. But the influence of the work did not remain confined to the East. It was translated into Latin by Bernardino of Sienna in the fifth decade of the twelfth century, and was used by Peter Lombard in the compilation of the *Sentences.* From this translation it has been thought that Peter adopted his method of exposition, whereby quotations of the Fathers are arranged under each head. J. C. A. Jr.

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JOHN OF SALISBURY. — A famous English scholar, teacher, diplomatist, historian, philosopher, and bishop of the twelfth century (1115–1180). Early in life he crossed over to France, where he studied for fifteen years under Abélard (*q.v.*) and other great teachers and secured the best scholarly training which was to be had. Returning to England, he became secretary to Archbishop Theobald, by whom his talent for practical affairs and remarkable scholarship were utilized in many ways. He was intrusted with many delicate and difficult undertakings both at home and abroad and exercised a quiet but powerful influence in the affairs of Church and State. Later on he was the trusted friend and adviser of Thomas à Becket, shared his misfortunes and was present at his tragic death. During the last four years of his life he was Bishop of Chartres.

He was an enthusiastic humanist and became the best classical scholar and the most elegant Latin writer of the Middle Ages. The range and readiness of his knowledge was unparalleled. He was more thoroughly familiar than any man of his time with the speculations of the ancient philosophers, was devoted to the Platonic tradition, and was the first to make the whole of Aristotle's *Organon* available to medieval readers. At the same time he was conversant with all the phases of the scholastic controversies and has given us accurate and critical accounts of contemporary philosophical discussions. His own philosophy is known as moderate realism. He struck a middle course between the extremes of realism and nominalism, combining the most valuable elements of both. While he regarded dialectic as sterile in itself, he admitted its efficiency as an aid to other disciplines. Reacting from the prevalent mysticism, he made a thorough examination of the psychological questions of the relative importance of sensation, perception, and understanding in arriving at concepts, and of the relations of faith, opinion, and knowledge. His historical knowledge was wide and accurate, and his theology was based upon extensive patristic learning. His acute and active intellect never tired of hearing and weighing the views of the men of his time, and he has left us valuable estimates of their learning and philosophy. His writings help us to understand the literary and scientific conditions of the twelfth century. His great learning and indefatigable industry were applied largely to educational pursuits. Not only was he one of the most cultured scholars of the century, but one of its greatest teachers, directing the investigations of a wide circle of learners. He discusses frankly the educational conditions of his day and describes in detail the methods then in use. He has left us in his *Metalogicus* one of the very few circumstantial accounts of medieval student life and educational procedure. His writings form an invaluable storehouse of information as to the matter and method of scholastic education. They cover a wide range of subjects. His *Policraticus* (*The Statesman's Book*) deals with the principles of government, philosophy, and learning and is the most perfect reflection remaining to us of the cultivated thought of the twelfth century. His *Metalogicus*, in four books, is a defense of the method and use of logic and philosophy. His *Letters*, some three hundred in number, shed valuable light upon the constitutional struggle then agitating England. His *De Septem Septenis* is a treatise upon the Seven Liberal Arts as then understood and practiced. His *Historia Pontificalis* and his *Lives of St. Anselm* and *St. Thomas à Becket* contain important historical materials, and possess great human interest. W. R.

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JOHN SCOTUS ERIUGENA. — See ERIUGENA.

JOHNS HOPKINS UNIVERSITY, BALTIMORE, MD. — Incorporated Aug. 24, 1867, and opened Oct. 3, 1876, has from its inception been influential among American institutions in upholding high standards of scholarship and scientific research. The university was founded by Johns Hopkins, who was born in Maryland, May 19, 1795, and died Dec. 24, 1873, in Baltimore, in which city he had accumulated a fortune. The first Board of Trustees was organized on June 13, 1870, and met on Feb. 6, 1874. The Board is a self-perpetuating body of twelve members and the President *ex officio;* the trustees are elected for life. The first president was Daniel Coit Gilman (*q.v.*); he was inaugurated on Feb. 22, 1901, and held office during the first twenty-five years of the university, resigning on Feb. 22, 1901. His successor was Ira Remsen, LL.D., Ph.D., professor of chemistry in the university, inaugurated on Feb. 22, 1902. Upon the inauguration of President Remsen a suburban tract of 176 acres at Homewood was given as a future site by William Weyman, William Keyser, Francis M. Jencks, Julian Le Roy White, and William H. Buckler of Baltimore, and Samuel Keyser of New York. Fifty acres of this property have been deeded to the city for a public park. The site has been improved by the construction of a greenhouse and an athletic field. Plans for new buildings have been drawn, after a competition among selected architects, and building operations have been begun.

The institution maintains collegiate instruction for undergraduates. Features emphasized in this work are the distinction between the discipline of college study and the freedom of advanced research; a modified elective system of studies (the "group system"; see COLLEGE, AMERICAN, under *Present Type of College Curricula*); and the influence upon undergraduates of distinguished professors and of the neighborhood of a body of graduate scholars conducting original investigations. Admission depends upon the presentation of a certificate showing completion of courses in arithmetic, political geography, freehand drawing, and a science, preliminary to examinations in English, Latin, mathematics, history, and either Greek or French or German. No certificates are accepted in place of examinations. In 1907 the course was increased from three to four years, with an increase in enrollment. The principal work of the university has lain in its graduate courses leading to the degree of Doctor of Philosophy, which may be gained in the departments of mathematics, physics, astronomy, chemistry, geology, zoölogy, botany, physiology, Greek, Latin, classical archæology, Sanskrit and comparative philology, Oriental languages, English, German, Romance languages, history, political economy, political science, and philosophy. A graduate department of education is planned. An important place in the university has always been occupied by the "fellows"; twenty fellowships are awarded annually, each yielding $500, but not exempting the holder from tuition. Certain classes of individuals are also eligible for appointment as "fellows by courtesy." From its inception the university has offered, from time to time, systematic courses of public lectures. Since 1890 extension courses have been given for teachers and others in Baltimore; a number of these courses, which ordinarily do not carry credit for a degree, are offered in coöperation with Goucher College of Baltimore (*q.v.*). Admission is by examination or certificate. The medical school of Johns Hopkins University is one of the strongest in the United States. Its buildings, in another portion of the city from the other departments and adjoining the Johns Hopkins Hospital, include a central structure devoted chiefly to administration, two large private wards, a number of buildings containing separate wards, a large dispensary building, a surgical building and amphitheater, and a nurses' home. The Harriet Lane Home for Invalid Children, the Phipps Psychiatric Clinic, and the Phipps Dispensary for the Treatment of Tuberculosis are situated within the hospital grounds. The school has numbered among its professors Sir William Osler, now Regius Professor in Oxford University, Howard A. Kelly, a gynecologist, and William H. Welch, pathologist. The school is preëminent in medical research. Johns Hopkins University is one of the institutions originally accepted by the Carnegie Foundation for the Advancement of Teaching.

The buildings including those for the Medical School are valued at $1,577,330.40, with equipment. The productive endowment is $4,557,537.07. The State of Maryland appropriates $25,000. The library has 137,000 volumes. The average salary of a professor is $3184. There are (1910–1911) 197 members of the resident instructing staff, and 15 non-resident lecturers; 54 are full professors. The student enrollment was 781, of whom there were 156 graduate students; 348 medical students, 52 physicians attending special courses, and 188 undergraduates. C. G.

See Gilman, Daniel Coit.

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JOHNSON, ELLEN CHENEY (1819–1899). — Leader in the movement for reform schools for delinquent girls, was educated in the public schools and at the Francestown (N.H.) Academy. During the Civil War she engaged in the soldiers' relief work of the Sanitary Commission, and at its close engaged in prison reform work. She was a member of the Board of Prison Commissioners of Massachusetts, and superintendent of the Massachusetts Reformatory for Women at Sherborn (near Framingham) from 1884 to 1899. She wrote many papers on reformatory education. W. S. M.

See Reformatory Education.

JOHNSON, SAMUEL (1709–1784). — It would be strange if among the numerous interests of the great English writer, some characteristic utterances on education were not to be found. His own career as usher in the school at Market-Bosworth and as master of an academy where he only had three pupils, among them David Garrick, was not marked by success, nor does his *Scheme for the Classes of a Grammar School* display any originality. Strongly devoted to the humanities, he failed to recognize the value of other subjects. Hence the severity with which he criticizes Milton's *Tractate* and its emphasis on sciences and external nature. "The first requisite," he says, "is the religious and moral knowledge of right and wrong; the next is an acquaintance with the history of mankind; . . . we are perpetually moralists but we are geometricians only by chance. Our intercourse with intellectual nature is necessary; our speculations upon matter are voluntary and at leisure. . . . Those authors, therefore, are to be read at school, that supply most axioms of prudence, most principles of moral truth and most materials for conversation; and these purposes are best served by poets, orators, and historians." To the view that popular education would make people less industrious he replied, "when everybody learns to read and write, it is no longer a distinction." Of the public boarding schools he had a high opinion in general for "there is the collision of mind with mind, or the radiance of many minds pointing to one center." But there are exceptions, as in the case of dull or idle boys, where the private school is to be preferred. On the question of corporal punishment, Johnson has made several pronouncements, generally in its favor. He himself had been severely disciplined at school, but that apparently did not affect his judgment of it. "A child is afraid of being whipped, and gets his task, and there's an end on't; whereas by exciting emulation and comparisons of superiority, you lay the foundation of lasting mischief," and again, "Correction in itself is not cruel; children being not reasonable, can be governed only by fear." Of the power which he attributed to education the following is the best evidence. "I do not deny, sir, but there is some original difference in minds, but it is nothing in comparison of what is formed by education." Nowhere does Johnson devote himself to a general discussion of education, with the brief exception of the passage in the *Life of Milton.* His *obiter dicta,* however, are truly representative of the attitude of the cultured classes of the period to education.

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BARNARD. *American Journal of Education*, Vol. II, p. 66; Vol. XIII, pp. 359 *sqq.*

JOHNSON, SAMUEL, JR. (1757–1836). — Lexicographer, was educated at Yale College, and published the first dictionary in the English language in America (New Haven, 1798). He was engaged in teaching, and refers to himself in the preface of his dictionary as "an instructor of youth for many years." Besides various augmented editions of his dictionary, he published a *Grammar of the English Tongue* and a *History of the English Language*.
W. S. M.

JOHNSON, SAMUEL, SR. (1696–1772). — First president of Columbia College (then King's College) and educational writer, was born at Guilford, Ct., in 1696, and died at Stratford, Ct., in 1772. He graduated at Yale College in 1714. For two years he was a private family instructor and for three years a tutor at Yale. For thirty years he was engaged in the ministry, and in 1754 he was selected as president of the newly organized King's College in New York. This position he held until 1763, when he was succeeded by Myles Cooper (*q.v.*). His educational writings include: *Compendium of Logic* (1752), *System of Morality* (1746), *English Grammar* (1765), *Hebrew Grammar* (1767), and numerous essays and sermons on education and religion.
W. S. M.

See COLUMBIA UNIVERSITY.

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JOHNSON, WALTER ROGERS (1794–1852). — Educational author and reformer, was born at Leominster, Mass. He studied at Groton Academy and was graduated from Harvard College in 1819. He was principal of academies at Framingham and Salem, Mass., and Germantown, Pa. (1819–1826); principal of the high school of Franklin Institute, Philadelphia (1826–1836), and professor in the University of Pennsylvania (1839–1843). He was afterwards connected with the Smithsonian Institution (*q.v.*) and carried on scientific investigations for the government of the United States. He made a personal investigation of the condition of common school education in Pennsylvania (1822–1823) and was active in the passage of the common school law of that state in 1834. In his *Improvement of Learning in the United States* (1825) he strongly advocated the establishment by the State of schools for the training of teachers. He believed it was a mistake to teach Greek in secondary schools as a dead language, and in the Germantown Academy and Franklin Institute the ancient language was taught only by oral and conversational methods. He was one of the representatives of the United States to the first International Congress of Education held at London (1851), and was active in the organization of the American Association for the Advancement of Education (*q.v.*) and the American Association for the Advancement of Science, of which he was the first secretary. His published educational works include: *Essays on Education* (1832), *Improvement of Learning in the United States* (1825), *Provisions for Education in Pennsylvania* (1826), *Lectures on Mechanics and Natural Philosophy* (1828), *Introduction to the Greek Language* (1829), *Duty of the Several States in Regard to Education* (1830), *Importance of Linear Drawing* (1830), *General State of Education in the United States* (1831), *Schools of Art* (1835), and *Chemistry and Natural Philosophy* (1840). He contributed numerous articles on education to the *Journal of the Franklin Institute*, *American Journal of Education*, *American Annals of Education*, and the proceedings of the American Institute of Instruction.
W. S. M.

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JOHNSON, WARREN (1830–1877). — State superintendent of schools, was educated at Farmington Academy and Bowdoin College, graduating in 1854. He was for two years principal of the academy at Foxcroft, Me.; two years tutor at Bowdoin College; ten years principal of a secondary school for boys at Topsham, Me., and eight years (1868–1876) state superintendent of public instruction in Maine. Author of reports and addresses on education.
W. S. M.

JOHNSON, WILLIAM SAMUEL (1727–1819). — Third president of Columbia College, was graduated at Yale College in 1744, engaged in the practice of law, and attained eminence in public life. He was a member of the Continental Congress, a judge of the supreme court, a member of the convention that framed the constitution of the United States, and one of the first senators from Connecticut to the United States Congress. He was president of Columbia College from 1792 to 1800. He was the author of a *History of Greece in Verse* (1807) and of several works on literature and science.
W. S. M.

See COLUMBIA UNIVERSITY.

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JOHNSTON, JOHN (1806–1879). — Textbook author, graduated at Bowdoin College in 1823. He was an instructor and principal of Cazenovia Seminary, and professor at Wesleyan University. He wrote *Rudiments of Philosophy*, *Manual of Natural Philosophy*, *Chemistry for Common Schools*, and essays on science teaching and scientific subjects. W. S. M.

JOHNSTON, WILLIAM PRESTON (1831–1899). — First president of Tulane University (*q.v.*) and active in educational movements in the South, was graduated at Yale University in 1852. He served during the Civil War, and attained the rank of colonel on the staff of President Jefferson Davis. He was professor at Washington and Lee University (1867–1880), president of Louisiana State University and Agriculture College (1880–1883), and president (first) of Tulane University (1883–1889). He was active in the organization of higher education in the South and published numerous papers on educational subjects. W. S. M.

See TULANE UNIVERSITY.

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JOHONNOT, JAMES (1823–1888). — Institute lecturer and educational writer, was educated in the district schools of Vermont and at the Albany State Normal School. He was teacher and principal of schools in Vermont and New York; institute conductor in New York; principal of the high school at Joliet, Ill.; principal of the State Normal School at Warrensburg, Mo., and superintendent of schools at Deposit, N.Y. He was the author of a work on *School Architecture* (1872), *Principals and Practice of Teaching* (1886), and of several supplementary readers for school children. W. S. M.

JOINERY. — See MANUAL TRAINING.

JOINT DISTRICT. — See DISTRICTS, SCHOOL; CONSOLIDATION OF SCHOOLS.

JOINT UNION DISTRICT. — See DISTRICTS, SCHOOL; UNION SCHOOLS; CONSOLIDATION OF SCHOOLS.

JONES, GRIFFITH. — See CHARITY SCHOOLS; WALES, EDUCATION IN.

JONES, HUGH (1669–1760). — Educator, received his training in the universities of England. He was for sixty-five years a teacher and preacher in Virginia, and from 1702 to 1722 a professor in the College of William and Mary. He urged the introduction of history and civics into secondary school courses and recommended the establishment of special departments in the colleges for the training of the civil servants of the colonies. He was author of a *History of Virginia*, and of several papers on educational topics. W. S. M.

JORDANUS NEMORARIUS (d. 1236). — The greatest mathematician of the thirteenth century, excepting Fibonacci (*q.v.*). He was born at Borgentreich, in the diocese of Paderborn, and died in 1236. He studied at Paris. He is also known as Jordanus de Saxonia. His arithmetic was based on the theory of numbers as set forth by Boethius. It was first printed in 1496, at Paris, and went through several editions. He also wrote a work *De Ponderibus* which was edited by Apianus and was published at Nürnberg in 1533. An *Algorithmus Demonstratus* is also attributed to him. D. E. S.

JOUFFROY, THÉODORE-SIMON (1796–1842). — French philosopher and psychologist; born at Pontets and died at Paris. Entered the École Normale in 1814, and in 1817 was made doctor of philosophy and *élève-répetiteur* in philosophy in the École, and was given the chair of philosophy in the Collège Bourbon, which he resigned in 1820. In 1822 the École Normale was closed, and Jouffroy began to give private courses in philosophy, and to write for several literary journals. When the École Normale was reopened in 1828, he was made *maître des conférences* in philosophy. From 1828 until his death he was in succession professor of ancient philosophy, adjunct professor of modern philosophy, and professor of philosophy in the Faculté des Lettres at Paris. From 1833 to 1838 he was professor of Greek and Latin philosophy in the Collège de France, and in 1838 became librarian of the University. Jouffroy was a pupil and associate of Cousin and of Royer-Collard. His spiritualistic rationalism exerted considerable influence on educational thought in France during the second quarter of the nineteenth century. His chief work was in translating and expounding the Scottish philosophy. His principal writings were: translation of Dugald Stewart's *Moral Philosophy*, 1826; *Mélanges philosophiques*, 1823; *Cours de droit naturel*, 1835–1842; *Nouveaux mélanges philosophiques*, 1842; and *Cours d'ésthetique*, 1843. K. D.

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JOURNAL OF PEDAGOGY. — See JOURNALISM, EDUCATIONAL.

JOURNALISM, EDUCATION FOR. — Professional education for journalism is of recent origin. Only within the last ten years in the United States has there been a decided movement in American colleges and universities toward the establishment and maintenance of courses in journalism or departments and schools of journalism. Occasional lectures upon journalism had been given in various institutions, but no organized courses in journalism or in preparation for journalism had been offered. The state universities of the Middle West were the leaders in the training for the new profession.

In different colleges and universities different courses are given, and there are various forms of organization for the courses. At the University of Wisconsin courses are offered in the academic department associated with the work in English. In Kansas at the state University two years' work is given in reporting, and in news and editorial writing. The courses are grouped in the academic department. At the Kansas State Agricultural College, at the Iowa Agricultural College, and at the Wisconsin Agricultural College courses are given in agricultural journalism. These college courses are to prepare writers on farm papers for the presentation of the news of agriculture in clear, convincing, attractive style. At the University of Illinois, the University of Indiana, the University of Ohio, the University of Washington, the University of Pittsburg, and other institutions there are departments of journalism in which fundamental courses in the gathering and presentation of news are given. The University of California, the University of Oklahoma, the University of North Dakota, Marquette College, and other institutions give special work for students who plan to take up journalism as a profession. At the University of Missouri journalism is a separate professional school, coördinate with the schools of law, medicine, engineering, and education. It has a separate faculty and gives, upon completion of a three years' course, the degree of Bachelor of Science in Journalism. Sixty hours of college work, in addition to a four years' high school course, are required for entrance. In other universities the courses in journalism count towards the degree of Bachelor of Arts. The gift of the late Joseph Pulitzer, proprietor of the *New York World* and the *St. Louis Post-Dispatch*, of $2,000,000 to Columbia University for the establishment of a School of Journalism in connection with that institution insures education for journalism at Columbia. At Cornell University, Yale University, the University of Pennsylvania, and the University of Virginia, and in several other institutions lectures on journalism, usually by men in the active practice of the profession, are given.

While all studies are regarded as helpful in education for journalism — so broad is the field of work of the journalist — the studies which he may take at the different colleges and universities are correlated so as to present the subjects which will be of the most immediate and practical service. Students in journalism are usually most interested in English and other languages, history, economics, sociology, psychology, political science, philosophy, and logic, on the academic side. On the professional side, journalism courses in these institutions include courses in news gathering, reporting, news writing, newspaper making, newspaper administration, editorial writing, editorial direction, the history and principles of journalism, copy reading, illustration, the ethics of journalism, advertising and newspaper publishing, and newspaper jurisprudence. The last-named subject includes a consideration of the libel law in its relation to newspaper publication. The names of these courses given in education for journalism suggest their content.

The new movement in education for journalism has as its fundamental and distinctive feature the application of the laboratory method. The students in the present-day schools or departments of journalism are taught to produce newspapers by producing newspapers. In nearly every college or university where journalism is now seriously taught, the students of journalism issue, under faculty advice, supervision, or direction, a newspaper, usually a daily newspaper, the work on which, other than mechanical, the reporting, news writing, editorial writing and other work, is done by the journalism students. In some cases the entire publication, even the mechanical work — typesetting and press work — is by the students. As the hospital supplies bedside instruction to the student of medicine, the training school practice in teaching to the student of education, and the moot court a laboratory for the student of law, so the newspaper affords actual practice for the student of journalism. Some of these newspapers are not mere college journals, but are general newspapers, giving the news of the community in which they are published. They carry advertising in their columns and have regular subscription lists and the students make them profitable business enterprises. At this point the schools of journalism are not theoretical, but intensely practical.

More than one thousand students are now enrolled in courses in journalism in American universities. The number increases each school year.

Assuming the teaching of journalism or education in courses preparatory to journalism, the problem of organization for such education presents itself. Various conditions existing in various institutions made necessary various forms of organization. The organization, moreover, depends upon the extent of courses in journalism and upon the general purpose and content of such courses. An organization which is sufficient where only an occasional lecture on journalism is given, or where courses in journalism are offered in connection with an already existing department of instruction, is manifestly insufficient where more extended courses are offered and independently of any other department of instruction. The tendency is towards the separate grouping of journalism studies and to such organization of the professional school or department as will best bring about such separate grouping. This is obtained, in some degree at least, under practically any form of organization. It is obtained in the newer forms of organization by grouping specifically and formally the journalism students in a separate and distinct professional department or school in charge of a responsible faculty. In the organization of such faculty to the teachers selected from the College of Arts and Science or academic department, whose subjects are those prescribed or usually elected in preparation for journalism, are added the members of the so-called professional faculty, who are teachers who give courses in theoretical and practical journalism. The schools of law, medicine, engineering, and particularly the school of education, have afforded models for the organization of the school of journalism. This form of organization dignifies education for journalism, concentrates the attention of the students upon the subjects best adapted to their professional education and lends interest, emphasis, and strength to the courses thus offered. W. W.

See NEWSPAPERS AND PERIODICALS IN SCHOOLS AND COLLEGES.

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JOURNALS AND JOURNALISM, EDUCATIONAL. — Specialized professional publications develop only with the growth of a profession. Hence educational journals of a professional type appeared only in the nineteenth century, and in most countries quite late in that century. Such professional journals were preceded by a type of publications, also properly called educational journals, which aimed to create popular sentiment in favor of public education. These in turn were preceded by a type of publications which were designed to improve the general intellectual condition of the people. Among these were *The Tatler* (1709) and *The Spectator* (1711) in England, and the *Moralische Wochenschriften* (1713) in Germany. These were counterparts of numerous book publications, such as Defoe, *Family Instructor.* The development of professional publications follows closely that of development of educational associations (*q.v.*). (See also EDUCATIONAL JOURNALISM.)

The following article gives, first, the more important of the second type of magazines in England, the United States, and Germany, and second, a selected list of contemporary educational publications of various types in a large number of countries where the educational interest is great. In this connection see also the bibliographies in connection with the articles on the educational systems of the various countries, and also the article on OFFICIAL PUBLICATIONS ON EDUCATION.

England. — Just as the study of education and the growth of a teaching profession are of recent origin, so the journals devoted to the interests of the subject and the profession made only a fitful progress up to the last quarter of the nineteenth century, from which period the best of the modern educational journals date. Although, as will be seen from the following article, which is not exhaustive, the number of such journals is large, few continued for more than about five years. But much valuable matter dealing with administration found, as it still finds, its way into the general magazines, periodicals, and newspapers, with which, however, no attempt will be made to deal in this article. Of the early magazines many were devoted to special causes or were associated with special societies. Probably the earliest educational journal in England was the *Guardian of Education* conducted by Mrs. Trimmer of Lancasterian fame as "a periodical work consisting of a practical essay on Christian education, founded immediately on the Scriptures and the sacred offices of the Church of England; memoirs of modern philosophers and extracts from their writings, extracts from sermons and other books relating to religious education, and a copious examination of modern systems of education, children's books and books for young persons." It appeared in 1802, and eight or nine numbers were issued each year, dealing with education from the religious and moral point of view. This magazine existed for four years. It is significant that more magazines were devoted to Sunday school work than to any other branch of education. The nature of the magazines which follow needs no further description. *The Sunday School Teachers' Magazine and Journal of Education* (1830–1867); the *Directory of Sunday School Teachers* (1831); the *Teachers' Offering and Sunday School Monthly* (1840–1862; 1863–1864); *The Teachers' Manual, a Repository of Practical Suggestions and Biblical Illustrations* (1840–1845); *The Sunday Scholar* (1843–1844); *The Sunday School Directory of Scripture Instruction together with the Psalms and Lessons* (1844–1846); *The Teachers' Monthly Magazine* published by the Church of England Sunday School Institute (1851–1854), and continued in 1857–1864 as the *Church of England Sunday School Monthly Magazine for*

Teachers, and in 1865 as the *New Monthly Magazine for Church of England School Teachers* (1865–1867); and many others. A periodical of a general educational character was the *Educational Magazine and Journal of Christian Philanthropy and of Public Utility* (1835–1836), continued as the *Educational Magazine and Journal of Scholastic Literature* (1839–1841), which during its last year was edited by F. D. Maurice (*q.v.*). *The English Journal of Education* was "specially designed as a medium of correspondence among parochial clergymen and all promoters of sound education, parents, sponsors, schoolmasters, Sunday school teachers, etc." (1843); with it were incorporated the *Educational Expositor* (f. 1853), the *Educational Guardian* (f. 1859), and the *Museum* (f. 1861) in 1863 or 1864. It dealt also with elementary education and general educational questions, foreign educational systems, etc., although the belief was declared in the opening pages "that the principles of our education need not be imported from any other shore." The *Home and Colonial School Society Quarterly Educational Magazine* (1848) was the record of the society of that name (*q.v.*), and had as its object the "Christian education of the people." The same society issued in 1859 the *Home and Colonial School Society Educational Paper*, intended to help teachers in elementary schools by means of papers and the theory and practice of education. In 1831 the Society for the Diffusion of Useful Knowledge, of which Lord Brougham (*q.v.*) was chairman, issued the *Quarterly Journal of Education*, which attempted to record the progress of education in various countries and to communicate interesting developments and secure unity to education in the British Isles. This journal lasted until 1836. The British and Foreign School Society made known its objects through its organ, the *Educational Record* (1848), a continuation of the *Quarterly Extract* (1827), which also published notes as to the central administration of elementary education and papers on method, and still continues to appear. *The Educator, or Home, the School and the Teacher*, was established in 1854 as the organ of the Congregational Board of Education. The agitation for the centralization of education was responsible for several periodicals. *The Advocate of National Instruction* appeared in 1853 "for promoting the establishment of a general system of schools for secular instruction, supported by local rates and under local management" (1853–1854). The organ of the National Education League was the *National Education League Monthly Paper* (1869–1877), which discussed elementary education from the standpoint of undenominationalism; while a contemporary periodical in the interests of voluntary schools was the *National Society's Monthly Paper* (1847), which in 1876 became the *School Guardian*, a weekly educational newspaper and review.

Magazines of purely professional interest made their appearance throughout the century, but were all short-lived. *The National School Magazine* (1824), though intended for boys and girls, was a strong advocate of the national school. The *Educational Review and Magazine* (1826) only existed one year in the interests of higher classes of society. *The Schoolmaster* (1829) indicates its scope in its subtitle, "a weekly essay, the object of which is to point out the errors and defects of the present systems of education and modes of managing children and to propose better." The *Quarterly Journal of Education* has already been referred to as having appeared in 1831. *The Scholastic Journal and Magazine of Education* was issued for one year (1840). In 1844 appeared for the one year the *British Annals of Education, being the Scholastic Review* "of educational, philosophical, scientific, artistical, and general intelligence." In 1847 was formed what has proved to be the longest lived educational journal in England, the *Educational Times*, the official organ of the College of Preceptors (*q.v.*), which records current events and discusses educational questions; a feature of this journal has for a long time been the number of pages each month devoted to mathematical problems. The practical work of teachers in elementary schools was treated in the *Papers for the Schoolmaster* (1851–1853). *The Educational Expositor*, "specially designed for schoolmasters and schoolmistresses, mothers of families, and all interested in education" (1853), included principles and methods of teaching, biography of eminent teachers and educators, translations from foreign educational works and reviews; it was incorporated with the *English Journal of Education*. The three branches of education, elementary, secondary, and university, were covered in the *Literarium or Educational Gazette*, "a weekly journal of Education, Literature, and Science" (1857). *The Educational Guardian* was edited and conducted by schoolmasters in the interests of the elementary school teacher mainly (1860–1863) when it was incorporated with the *English Journal of Education*. The pupil teacher system, by which young apprenticed teachers were practically thrown on their own resources to prepare themselves academically for the profession, led to the publication of several journals in their interests; of these may be mentioned *The School and the Teacher*, "for the use of schoolmasters, schoolmistresses, and pupil teachers in elementary schools, conducted by Church Schoolmasters" (1854); the *Pupil Teacher*, a monthly journal of practical education and educational literature (1857); the *Teachers' Assistant and Pupil Teachers' Guide* (1876–1880), incorporated with *The Students' Magazine*, a monthly journal of assistance for private and class students in literature, science, and art; *The Teachers' Magazine*, being a monthly miscellany of hints and helps to elementary teachers (1880).

The *Museum*, which was issued in 1861, was "a quarterly magazine of Education, Literature, and Science," and aimed to give an accurate record of educational events, to discuss current educational questions, and to combine with this the element of general literature. It included among its contributors Sir Joshua Fitch, S. S. Laurie, and J. S. Blackie. In 1865 it was issued monthly under the title *Museum and English Journal of Education*, having incorporated the *English Journal of Education* mentioned above. The *Academia*, scholastic, educational, and literary record (1868), was a journal which discussed both elementary and secondary questions, but was probably intended for secondary teachers. In 1869 appeared the *Educational Reporter*, "a new monthly journal reflecting the opinions and advocating the interests of the scholastic profession," which up to 1874 dealt with elementary and science teaching, and after that date as the *Educational Reporter and Teachers' Review* gave a large share of attention to questions of secondary education.

In 1870 the *School Government Chronicle*, now the *School Government Chronicle and Education Authorities Gazette*, made its appearance. This journal is the best organ on the administration of education, its reports and comments covering the proceedings of Parliament, the Board of Education, the Local Government Board, the Home Office, and the local education authorities. All parts of the educational system are dealt with. For a long time the journal stood for the principles of unity in the educational profession and administration, which was more or less achieved in 1899 and 1902. The *Educational Review*, which has as its subtitle "embracing topics of interest in general literature and science," appeared from January to July of 1871, and contained papers dealing with all grades of education. The National Union of Elementary Teachers began in 1872 the issue of its official organ, which has continued to appear weekly to the present day as *The Schoolmaster*, dealing not only with current news about elementary school teachers, but questions brought up in Parliament and educational committees particularly affecting elementary education. *The Journal of the Women's Education Union* (1873), edited by Miss Shirreff and G. C. T. Bartley, was, as the name indicates, the organ of the society which aimed at the improvement of education for all classes of women.

In 1879 the *Journal of Education*, which is at present one of the leading educational periodicals in England, was issued for the first time under its present title. Its history goes back to 1870, when the *Quarterly Journal of Education and Scholastic Advertiser* appeared; the title was changed in 1875 to the *Monthly Journal of Education*, and in the following year to the *Journal of Education with which are incorporated the Educational Reporter and Scholastic Advertiser*. In 1879 there was also incorporated in the present magazine the *Scholastic Register*, which dated from 1869. The *Journal of Education* is the best record of English educational thought and practice. Among the contributors may be found the names of most of the leaders in the recent educational development of England. The journal is the official organ of the Teachers' Guild (*q.v.*) since 1884, and is also employed as the medium of communication of the Association of Teachers in the Secondary Schools of Scotland and the Incorporated Association of Assistant Masters. While the articles deal with all phases of education at home and abroad, secondary education receives particular attention. Another feature is the Translation Prize which has been offered monthly since 1879. In 1881 was started the *Practical Teacher*, which still continues as a monthly devoted largely, but by no means altogether, to the interests of infant and elementary school teachers. Child study, geography, and science also form features of the journal. *School*, a medium for the ventilation of all matters of educational interest, was issued for four years (1886–1890). In 1899 another of the current leading periodicals was established, the *School World*, a monthly illustrated magazine of educational work and progress, devoted mainly to questions of secondary education and the practical work of the classroom. Important contributions have appeared on the teaching of science in all its branches. Notes are given on educational progress throughout Great Britain and Ireland. Recently the scope of the articles has been extended, becoming more general in character than formerly. *School*, a monthly record of educational thought and progress, appeared for five years (1904–1909), and dealt with topics of general interest in educational theory, practice, and administration.

The formation of numerous associations within the last few years (see EDUCATIONAL ASSOCIATIONS), devoted to special subjects, has led to an increase in the number of special-subject periodicals, of which the following may be mentioned: *Classical Review* (monthly), connected with the Classical Association of England and Wales, and of Scotland, and of the Oxford Philological Society, and the *Classical Quarterly*; *Modern Language Teaching*, the organ of the Modern Language Association; the *Modern Language Review*; the *Mathematical Gazette*, the organ of the Mathematical Association; *Child Study* (formerly the *Paidologist*, 1899), of the Child Study Society; *Child Life* (1899), of the Froebel Society; and several others. A number of periodicals serve as the organs of general educational associations, of which some have already been referred to; others are the *A. M. A.*, of the Assistant Masters' Association; the *Teachers' Guild*

Quarterly; the *Preparatory Schools' Review* (1895), of the Association of Preparatory Schools; the *Parents' Review* (1890), of the Parents' National Education Union; *Secondary Education* (1896), of the Private Schools Association, Incorporated; the *Highway,* of the Workers' Educational Association; *Training College Record and Journal of Experimental Pedagogy,* of the Training College Association, and several local publications. The most recent publication is *The Child,* " a monthly journal devoted to child welfare "; it is according to announcements, " a medico-sociological and educational journal dealing with all questions relating to infancy, childhood, and youth." The first number appeared in October, 1910. A. E. T. and I. L. K.

United States. — The first educational journal published in the United States was *The Academician* (1818–1820). It was a semiweekly of sixteen octavo pages, and was edited by Albert and John W. Pickett and published by the Incorporated Society of Teachers of New York. The first number appeared on the 7th of February, 1818, and included essays on the best modes of education, notices of literary and philosophical institutions, and observations on moral and physical science. The labors of Pestalozzi and Joseph Lancaster, and the reforms which they advocated, were leading features of the journal during its two years' existence. *The American Journal of Education* (1826–1830) was a monthly of sixty-four octavo pages edited by William Russell (*q.v.*), and was published by Tait, Green, and Co., of Boston. The first number (January, 1826) contains a prospectus of eight pages by the editor, in which he observes that " the spirit of inquiry, which has of late extended to everything connected with human improvement, has been directed with peculiar earnestness to the subject of education." Science and literature, he points out, have their respective publications; but education, a subject of the highest practical importance, has hitherto not had a proper vehicle of information. The field to be occupied by the new journal was to include: (1) record of facts regarding the past and present state of education in the United States and foreign countries; (2) enlarged and liberal views of education, with means of improvement in the science of instruction; (3) physical education; (4) female education, a topic which the editor deems " unspeakably important "; (5) moral training; and (6) early and elementary education. The editorial statement was followed by original articles on systems of infant schools, progress of physical education, course of study in the New York High School, and the Boston Monitorial School, the latter by William B. Fowle (*q.v.*). Twelve pages of reviews and ten pages of intelligence completed the first number. Subsequent numbers contained articles on infant schools, the lyceum movement, female education, monitorial schools, the educational value of the study of Latin and Greek, progress of education in the United States and Europe. The articles as a rule were not signed; but so far as there are signatures and initials, the contributors included Samuel R. Hall, A. Bronson Alcott, Thomas H. Gallaudet, William B. Fowle, Wilbur Fisk, William C. Woodbridge, James C. Carter, Walter R. Johnson, Cornelius C. Felton, and Josiah Holbrook (*qq.v*). Among foreign educational writers whose articles were translated and republished were Pestalozzi, Jacotot, Maria Edgeworth, Jean Paul Richter, George Combe, and Elizabeth Harrison. The foreign correspondence included letters from Louvain on Jacotot's system of instruction in languages, Fellenberg's scheme of agricultural and industrial education at Hofwyl, and nine of Pestalozzi's letters to James Pierrepont Greaves (*q.v.*), on early education. William C. Woodbridge (*q.v.*) succeeded Mr. Russell as editor of the journal in January, 1829, and in June, 1830, it was merged into the *American Annals of Education* (1830–1839). The *Annals* continued the form and general character of the *Journal.* Mr. Woodbridge declared in his introductory editorial that it was his purpose to make the *Annals* subservient to the best interests of educational progress, and to draw from other countries the fruits of experience and observation in matters of institutions and methods of instruction. The first volume contained letters from Hofwyl on Fellenberg's system of education, accounts of educational legislation in New York, New Jersey, and Kentucky, and a notable series of articles on teachers' seminaries by Thomas H. Gallaudet (*q.v.*). Among important articles in subsequent volumes of the *Annals* were the study of modern languages, school discipline, the language of infancy, manual labor schools, study of American history, ventilation of schoolhouses, use of the Bible in the public school, the study of physiology, music as a branch of education, moral and religious instruction, female education, truancy, education and crime, the use of pictures in schoolbooks, education of the American Indian, infant schools, letters from Hofwyl (twenty-two in all), articles on Harvard, Yale, Columbia, Princeton, Dartmouth, and West Point. The contributors included Walter R. Johnson, Catherine E. Beecher, Thomas H. Gallaudet, Samuel R. Hall, Goolde Brown, John Griscom, Lydia H. Sigourney, George Ticknor, Thomas S. Grimke, Jacob Abbott, William A. Alcott, Henry R. Schoolcraft, James G. Carter, William B. Fowle, Warren Burton, Theodore Dwight, Samuel G. Howe, and Horace Mann (*qq.v.*). Mr. Woodbridge was the editor of the *Annals* from 1830 to 1836, William A. Alcott during 1837, and M. G. Hubbard from 1838 to 1839. It was published in Boston, first by Carter and Hendee and later by Ticknor and Allen. Contemporaneous with the *Annals* was *The Com-*

mon School Assistant (1836–1840), a monthly journal edited at Albany by J. Orville Taylor (*q.v.*). As its name indicates, it was directly interested in the common school movement and the review of elementary school textbooks. Its contributors included James Wadsworth, Gideon Hawley, and John C. Spencer. Another New York state journal was *The District School* (1840–1852), edited by Francis Dwight (*q.v.*), and including among its contributors Horace Mann, Henry Barnard, W. F. Phelps, and Samuel S. Randall (*qq.v.*). Still another New York journal was the *Teachers' Advocate* (1845–1852) which was edited by Joseph McKeen and to which Salem Town, E. North, Emma Willard, Catherine E. Beecher, William A. Alcott, and Chester Dewey contributed articles. This was followed by the *New York Teacher* (1852–1865) edited by Thomas Weston Valentine (*q.v.*). In New England the logical successors of the *American Annals of Education* were the *Common School Journal* (1838–1848), edited by Horace Mann (*q.v.*), and the *Connecticut Common School Journal* (1838–1842), edited by Henry Barnard (*q.v.*). Of most significance, however, was Barnard's *American Journal of Education* (1855–1881). This comprehensive work — thirty-one octavo volumes of more than eight hundred pages each — is a veritable encyclopedia of education. At a meeting of the American Association for the Advancement of Education (*q.v.*) held at Washington in 1854, Henry Barnard submitted a plan for a new quarterly journal of education which should include "accounts of systems, institutions, and methods of education, as well as current educational thought." The plan was approved by a committee appointed to consider the scheme, but as the necessary funds were not available, Barnard in the next year undertook the journal on his own responsibility. The first volume included accounts of the meetings of the American Association for the Advancement of Education (*q.v.*); Frederic D. Huntington's *Unconscious Tuition*, since become an educational classic; accounts, with statistics, of educational movements in England, France, Germany, Holland, and Russia, and the American states; sketches of the Lawrence Scientific School at Cambridge, the Peabody Institute at Danvers, the American Institution for the Deaf at Hartford, and the Perkins Institution for the Blind at Boston, with steel portraits of the founders of these institutions; papers on methods of teaching Latin, Greek, mathematics, and the physical sciences; education among the Hebrews and the Cherokee Indians; educational biographies of Ezekiel Cheever (*q.v.*) and Thomas H. Gallaudet (*q.v.*); besides articles on school discipline, the education of women, improvements practicable in American colleges, and the prevention of crime among children. The *Westminster Review* said of it: "The first volume of the *American Journal of Education* we received with unmingled pleasure, save in the regret that England has as yet nothing in the same field worthy of comparison with it." Practically all important educational writings, from Plato's *Republic* to Herbert Spencer's *Education*, were published in Barnard's *Journal*. He included accounts of all the great school systems of the world; histories of the systems of the different states of the American Union; sketches of the great educational reformers of the world, as well as of American educational leaders. Normal schools, institutes of technology, colleges and universities, educational associations, institutions for defective, dependent, and delinquent children, libraries, kindergartens, and practically every other subject relating to education, found exhaustive treatment in this monumental work; and all the American and foreign educational writers of the first three quarters of the nineteenth century are represented in its columns. In the publication of his *Journal* Barnard spent a private fortune of more than forty thousand dollars. To prevent the plates from going into the melting pot for type metal, the Henry Barnard Publishing Company, with William T. Harris as president and C. W. Bardeen as secretary, was organized in 1891. The *Journal* is now published and sold by Mr. Bardeen as a work of reference. *The College Courant* (1869–1874), edited by Chester C. Chatfield, was devoted to the interests of secondary and collegiate education, and *The Academy* (1886–1892), edited by George A. Bacon, was devoted to secondary education. Among the current American educational journals are the *Journal of Education* (1875), *School Bulletin* (1874), *School Journal* (1870), *Popular Educator* (1884), *Education* (1880), *Journal of Pedagogy* (1887), *Educational Review* (1891), *Pedagogical Seminary* (1891), *School Review* (1893), and *Elementary School Teacher* (1900). In many of the states of the Union there are journals which meet the local needs of particular geographic sections of the country.

W. S. M.

Germany. — The history of educational journals in Germany goes back to the early part of the eighteenth century. Their forerunners were the "moral weeklies" (*Moralische Wochenschriften*), the earliest of which appeared in Hamburg in 1713, and which were modeled after Steele's *Tatler* (1709) and Addison's *Spectator* (1711). Many other cities followed, such as Leipzig, Zürich, Berlin, Göttingen, Jena, Magdeburg, Königsberg, Danzig, Frankfort, etc. The most influential of these papers were the *Discourse der Mahlern*, published by the Swiss poets Bodmer and Breitinger in Zürich (1721), *Der Patriot* (Hamburg, 1724), and Gottsched's publication, *Die vernünftigen Tadlerinnen* (*Reasonable Female Critics*) (Halle and Leipzig, 1725). These and their numerous imitators devoted much attention to the reform of education. Many of the pedagogical ideas which later on were advocated by Rousseau and

Basedow find an earlier expression in these old weeklies. Through their influence on the educated classes, they prepared the soil for the spread of that enthusiasm for education which characterizes the second half of the eighteenth century.

Gradually the pedagogic interest in many of these weeklies predominated over the literary and social, and purely pedagogic journals also began to be published. Among the earliest are *Der getreue Hofmeister* (*The Faithful Tutor*), Frankfort and Leipzig, 1725; *Vierteljährliche Unterhandlungen mit Menschenfreunden über Erziehung* (*Quarterly Discussion with Philanthropists on Education*), published by Basedow in Bremen, 1768-1769; *Der Kinderfreund*, by C. T. Weisse, Leipzig, 1776, 24 vols.; *Pädagogische Ungterhaltungen*, by Campe and Basedow, Dessau, 1777; *Das Schweizerblatt*, by Pestalozzi (1782); *Der Bote aus Thüringen*, by Salzmann (Schnepfenthal, 1788). In the early part of the nineteenth century the most important pedagogical journals were Zerrenner's *Deutscher Schulfreund* (Magdeburg, 1791-1823), Stephani's *Der bayerische Schulfreund* (Erlangen, 1811-1832), and Gutsmuths's *Bibliothek für Pädagogik, Schulwesen und die gesammte pädagogische Literatur* (Gotha, 1800-1819).

With the greater attention paid to the preparation of the teacher and with the rise of the teachers' profession, the number of pedagogic journals increased, so that, at the beginning of the second quarter of the century, there were about twenty published in the different provinces of Germany. Prominent among these was Diesterweg's (*q.v.*) journal, *Rheinische Blätter für Erziehung und Unterricht* (1827-1902), and the *Allgemeine Schulzeitung*, which was published by Dilthey and Zimmermann in Darmstadt (1824-1881). The present output of the educational press in Germany is far in advance of that of any other country, both in the number of periodicals and the degree of specialization which has been reached. Not only every province, but almost every district, has its own educational paper, while, at the same time, a considerable number of papers circulate all over the country. Many of them appear weekly, or even twice a week, and one, the *Preussische Lehrerzeitung*, is a daily publication. The local papers are generally controlled by the teachers' associations, which are found in every part of Germany. Every kind of school, every subject of school study, as well as every important educational movement, has its own publication. Thus there are not only separate journals for the kindergarten, the Volkschule, the Bürgerschule, the Gymnasium, the Realschule, the University, as well as for teachers' seminaries, trade schools, commercial schools, continuation schools, etc., but, in addition to these, special periodicals for the study of methods in religious instruction, the mother tongue, modern languages, classical languages, geography, history, mathematics, biology, physics, and chemistry, drawing, manual training, physical education, etc. The fight for the reform of secondary schools was largely carried on in the *Zeitschrift für die Reform der höheren Schulen*, founded by Fr. Lange (Berlin, 1889), while *Das humanistische Gymnasium*, published (since 1890) by Jäger and Uhlig, represents the point of view of orthodox classicism. The success of the reform method in the teaching of modern languages was greatly aided by *Die neueren Sprachen*, founded in 1893 by Vietor in Marburg. In like manner the teachers interested in school hygiene, in female education, in the playground movement, in Herbartian pedagogy, and other movements, have each their own separate periodicals. There are also a number of educational periodicals especially devoted to the interests of Catholic schools.

The official publications of the different states, such as the *Zentralblatt für die gesammte Unterrichtsverwaltung in Preussen*, which has been published since 1859 by the Prussian Ministry of Education, furnish a periodical record of changes in laws and regulations affecting the schools. Of great importance also are the various *Jahrbücher* or annuals; the most important of these is the *Pädagogischer Jahresbericht*, founded by Nacke in 1845, and the *Jahresberichte über das höhere Schulwesen*, published since 1887 by Rethwisch in Berlin, the first devoted chiefly to elementary schools and the second to higher schools. Of the highest rank, both by the weight of its articles and the liberal spirit of its discussions, is the *Monatsschrift für höhere Schulen*, whose two editors are members of the Prussian Ministry of Education; this journal, whose publication was begun in 1902, immediately after the great Educational Conference of 1900, undertakes to further the reforms in secondary school methods, initiated by the Conference. Similar in the spirit of broad tolerance are the *Lehrproben und Lehrgänge* (*Model Lessons and Courses of Instruction*) which have appeared since 1885, in quarterly installments (Halle, Waisenhaus), a journal that furnishes a valuable record of improvement in the teaching methods of secondary school subjects. Akin to these journals in their great educational significance are the official published records of the *Direktorenconferenzen* in the various provinces of Prussia since 1879; at each of these conferences several important educational questions form the basis of prolonged discussions, each question being introduced by an expert referee previously designated for the task; a typical summary of the conclusions reached in these conferences published in Killmann, *Die Direktoren-Versammlungen des Königreichs Preussen von 1890-1900*. (Weidmann, Berlin.) *Frauenbildung*, edited by Dr. Wychgram since 1902, is the organ for the school activities of women in the different types of schools. In addition to these there are a number of statistical yearbooks and calendars, among which *Minerva*, a calendar for universities, and *Mushacke's German School Calendar* may be mentioned. F. M.

France. — Magazines dealing exclusively with educational questions did not appear in France until the organization of public education by the Convention and by Napoleon. In the eighteenth century such topics were not treated outside of special works, except in the *Mercure de France*, the *Encyclopédie* of Diderot (*q.v.*), the *Journal de Trévoux*, etc. It was during the decades of the revolutionary period that they found a place. At that time, 1811, Guizot founded the *Annales de l'Éducation;* soon after (1816) appeared the *Journal d'Éducation*, published by a society organized in Paris for the improvement of elementary education. This society, which is still active in the Rue du Fouarre in Paris, was the ancestor and prototype of the *sociétés philomathiques, associations philotechniques, cours d'adultes*, etc., so widespread in these days.

At present the educational journals may be divided into five classes: (1) Kindergarten and infant school journals for the information of teachers in these schools, *e.g. L'Éducation Enfantine.* To these may be added the recreational journals which are intended for children on the model of the *Magazin Pittoresque*, established in 1833, and which have increased since 1880, *e.g. Mon Journal* (1881); *St. Nicholas* (1880), etc. (2) Journals for teachers in elementary schools. These are the most numerous. They contain official documents, subjects for pupils' home work, information for use in classroom, educational suggestions, etc. The chief of these are: the *Manuel Général de l'Instruction Primaire*, established in 1832, weekly in 1850, monthly in 1858, and again weekly in 1864, and now conducted with the *Dictionnaire de Pédagogie* under the direction of M. F. Buisson; the *Revue de l'Enseignement Primaire et Primaire Supérieur*, a weekly giving besides educational articles others referring to professional, social, and associational questions. The *Revue Pédagogique*, under the direction of a committee of administrators, educationists, and members of the Ministry of Public Instruction, dealing with questions of primary, secondary, and higher education. (3) Journals for secondary education are the fewest in number. One of the earliest was *L'Université*, devoted to questions of public instruction and secondary education (1883); the *Revue de l'Enseignement Secondaire* (1884), which under the direction of M. Jules Gautier has coöperated in the majority of the reforms in secondary education; *Revue Universitaire de l'Enseignement Secondaire* (1891), changed to *Revue Universitaire* in 1892; *L'Enseignement Secondaire des Jeunes Filles*, etc. (4) Journals for higher education; in 1863 was established the *Revue des Cours Littéraires de la France et de l'Étranger*, and the *Revue des Cours Scientifiques*, etc., which in 1870 became the *Revue Bleu* and the *Revue Scientifique;* in 1878 M. Boutmy founded the *Société de l'Enseignement Supérieur* to examine all questions relative to higher education, and to collect all documents; this society has set in motion most of the reforms made in higher education, and has as its organ the *Revue Internationale de l'Enseignement* now under the direction of M. F. Picavet. Since 1892 there has appeared a *Revue Hebdomadaire des Cours et Conférences* in the Sorbonne, etc., originally undertaken by a group of students in the Sorbonne. Nearly all the special studies of the universities have each their own reviews. (5) Journals for general educational questions, with discussions on school hygiene, physical and moral education. These are at present few in number. There may be mentioned *L'Éducation Moderne*, established in 1906 by J. Philippe and G. Paul-Boncour, and now under the direction of G. Compayré; *L'Éducation* established in 1909 by G. Bertier. J. P.

The following is a list of current educational periodical , with the frequency of their issue (a., annual; q., quarterly; m., monthly; f., fortnightly; w., weekly; d., daily; irreg., irregular): —

Great Britain: —

General.
Educational Record, 3 nos. (London.)
Educational Times, m. (London.)
Highway (Workers' Education Association), m. (London.)
Journal of Education, m. (London.)
Morning Post (Schools and Scholars), w. (London.)
Parents' Review, m. (London.)
Practical Teacher, m. (London.)
School Guardian, w. (London.)
School Monthly, m. (London.)
School Review, m. (London.)
School World, m. (London.)
Times, Educational Supplement, w. (London.)

Administration.
Education, m. (London.)
London County Council Gazette, w. (London.)
School Government Chronicle, w. (London.)

Elementary.
Educational News, w. (Edinburgh.)
Infants' Magazine, m. (London.)
Irish School Weekly and Irish Teachers' Journal, w. (Dublin.)
London Teacher, w. (London.)
Notes for Teachers, q. (Edinburgh.)
Schoolmaster, w. (London.)
Schoolmistress, w. (London.)
Teacher, w. (London.)
Teacher's Aid, w. (London.)

Secondary.
A. M. A. (Journal of the Assistant Masters' Assoc.), m. (London.)
Preparatory Schools Review, 3 nos. (London.)
Secondary Education, 6 nos. (London.)
Teachers' Guild Quarterly, q. (London.)
Many of the general magazines emphasize secondary education.

Special Subjects.
Classical Quarterly, q. (London.)
Classical Review, m. (London.)
Educational Handwork, m. (London.)
Geographical Teacher, 3 nos. (London.)
Manual Training, m. (London.)
Mathematical Gazette, 6 nos. (London.)
Modern Language Review, q. (London.)

Modern Language Teaching, 8 nos. (London.)
Moral Education League Quarterly, q. (London.)
Music Student, w. (London.)
Physical Education, q. (London.)
School Hygiene, m. (London.)
School Music Review, m. (London.)
School Nature Study, 3 nos. (London.)

Educational Psychology.
Child Life, 8 nos. (London.)
Child Study, m. (London.)
Journal of Experimental Pedagogy and Training College Record, 3 nos. (London.)
The Child, m. (London.)

United States: —

General.
American Educational Review, m. (Chicago, New York.)
Education, 10 nos. (Boston.)
Educational Review, 10 nos. (Rahway, N.J.)
Journal of Education, w. (Boston.)
Pedagogical Seminary, q. (Worcester, Mass.)
School Journal, 10 nos. (New York.)
Teachers College Record, bm. except July. (New York.)
Western Journal of Education, m. (San Francisco.)

Higher.
Intercollegian, 9 nos. (New York.)

Secondary.
School Review, 10 nos. (Chicago.)

Elementary.
American Primary Teacher, 10 nos. (Boston.)
Educational Bi-monthly, bm. (Chicago.)
Educational Exchange, m. (Birmingham, Ala.)
Elementary School Teacher, 10 nos. (Chicago.)
Northwest Journal of Education, 10 nos. (Seattle.)
Popular Education, 10 nos. (Boston.)
Primary Education, 10 nos. (Boston.)
Progressive Journal of Education, 10 nos. (Chicago.)
Rocky Mountain Educator, ir. (Denver.)
School and Home Education, 10 nos. (Bloomington.)
School Bulletin, m. (Syracuse, N.Y.)
School Education, 9 nos. (Minneapolis.)
School World, m. (New York.)
Southern School Journal, m. (Lexington, Ky.)
Teachers' Magazine, 10 nos. (New York.)

Local (chiefly Elementary).
American Education, 10 nos. (Albany.)
Atlantic Educational Journal, 10 nos. (Baltimore.)
Canadian Teacher, m. (Toronto.)
Educator-Journal, m. (Indianapolis.)
Interstate Schoolmen, m. (Hutchinson, Kan.)
Progressive Teacher, 10 nos. (Nashville, Tenn.)
School Exchange, 5 times a year. (Newark, N.J.)
Schoolmaster, 10 nos. (Saginaw, Mich.)
Southern Educational Review, ir. (Chattanooga, Tenn.)
Teacher, 10 nos. (Philadelphia.)
Western Journal of Education, 10 nos. (Ypsilanti.)
Western School Journal, m. (Topeka, Kan.)

Psychology.
American Journal of Psychology, q. (Worcester, Mass.)
Journal of Animal Behavior, m. (Baltimore, Md.)
Journal of Educational Psychology, 10 nos. (Baltimore.)
Journal of Religious Psychology, q. (Worcester, Mass.)
Mind and Body, m. (Milwaukee.)
Psychological Bulletin, bm. (Lancaster, Pa.)
Psychological Clinic, 9 nos. (Philadelphia.)
Psychological Review, bm. (Lancaster, Pa.)

Administration.
American School Board Journal, m. (Milwaukee.)

Special Subjects.
American Physical Education Review, 9 nos. (Springfield, Mass.)
Boston Cooking School Magazine, 10 nos. (Boston.)
Catholic Educational Review, 10 nos. (St. Francis, Wis.)
Catholic School Journal, 10 nos. (Milwaukee.)
Child-Welfare Magazine, 10 nos. (Philadelphia.)
Classical Journal, 9 nos. (Chicago.)
History Teachers' Magazine, 10 nos. (Philadelphia.)
Journal of Geography, 10 nos. (Madison.)
Journal of Home Economics, bm. (Baltimore.)
Journal of Philosophy, Pyschology, and Scientific Method, sm. (New York.)
Kindergarten Magazine, 10 nos. (New York.)
Kindergarten Review, 10 nos. (Springfield, Mass.)
Manual Training Magazine, bm. (Peoria, Ill.)
Mathematics Teacher, q. (Lancaster, Pa.)
Mathematics Teacher, ir. (Syracuse, N.Y.)
Nature Study Review, 9 nos. (Chicago.)
Playground, m. (New York.)
Religious Education, bm. (Chicago.)
School Science and Mathematics, 9 nos. (Chicago.)
Science, w. (New York.)
Science and Mathematics (see School Science and Mathematics above).
Scientific Temperance Journal, m. (Boston.)
Southern Workman, m. (Hampton, Va.)
Vocational Education, bm. (Peoria, Ill.)

In addition to the above, there are a great number of minor educational journals chiefly of local circulation. Practically every state has such a local journal. In some states two or more compete for patronage. In the same way some of the larger cities possess such local organs. The Bureau of Education at Washington published in 1910 a list of more than 100 educational publications issued in the United States.

Germany: —

General.
Allgemeine Deutsche Lehrerzeitung, w. (Leipzig.)
Aus der Schule für die Schule, m. (Leipzig.)
Blätter für deutsche Erziehung. (Leipzig.)
Die deutsche Schule, m. (Leipzig.)
Die Jugendfürsorge, w. (Berlin.)
Der praktische Schulmann, 8 nos. (Leipzig.)
Der Säemann, m. (Leipzig.)
Deutsche Blätter für erziehende Unterricht, w. (Langensalza.)
Deutscher Frühling, m. (Leipzig.)
Deutsche Lehrerzeitung, w. (Berlin.)
Deutsche Schulzeitung, w. (Berlin.)
Jahrbuch des Vereins für wissenschaftliche Pädagogik, a. (Leipzig.)
Mitteilungen der Gesellschaft für deutsche Erziehungs- und Schulgeschichte, 2–4 nos. (Berlin.)
Monumenta Germaniae Paedagogica, ir. (Berlin.)
Neue Bahnen, m. (Leipzig.)
Pädagogische Abhandlungen, 12 nos. (Bielefeld.)
Pädagogische Blätter, q. (Munich.)
Pädagogische Jahresrundschau, m. (Trier.)
Pädagogische Monatshefte, m. (Stuttgart.)
Pädagogische Reform, w and q. (Hamburg.)
Pädagogische Studien, m. (Eisenach.)
Pädagogische Studien, 6 nos. (Dresden.)
Pädagogische Warte, f. . (Osterwieck.)
Pädagogische Zeitfragen, 6 nos. (Munich.)
Pädagogische Zeitung, w. (Berlin.)
Pädagogischer Jahresbericht, a. (Leipzig.)
Pädagogisches Archiv, m. (Brunswick.)
Zeitschrift für den deutschen Unterricht, m. (Leipzig.)
Zeitschrift für Philosophie und Pädagogik, 6 nos. (Langensalza.)

Administration.
Das Schulhaus, m. (Berlin.)
Das Schulzimmer, q. (Berlin.)
Die Schulpflege, f. (Berlin.)
Deutsche Schulgesetzsammlung. Zentralorgan für das gesammte Schulwesen im deutschen Reich in Österreich und der Schweiz, w. (Berlin.)

Ministerialblatt für Kirchen- und Schulangelegenheiten. (Munich.)
Preussisches Volksschularchiv, q. (Berlin.)
Zentralblatt f.d. gesammte Unterrichtsverwaltung. (Berlin.)

Elementary.
Blätter für die Schulpraxis für Volksschulen und Lehrerbildungsanstalten, 6 nos. (Nuremberg.)
Comenius-blätter für Volkserziehung, 5 nos. (Berlin.)
Die deutsche Volksschule, f. (Leipzig.)
Die katholische Volksschulen, f. (Innsbruck.)
Die zweisprachige Volksschulen, m. (Berlin.)
Der praktische Schulmann, 8 nos. (Leipzig.)
Der Schulfreund, m. (Hamm.)
Der Volksschulfreund, m. (Königsberg.)
Jahrbuch des deutschen Lehrervereins, a. (Leipzig.)
Jahrbuch des katholischen Lehrervereins, a. (Cologne.)
Pädagogischer Jahresbericht für Deutschlands Volksschullehrer, a. (Leipzig.)
Pädagogisches Jahrbuch, a. (Leipzig.)
Praxis der Landschule, m. (Goslar.)
Praxis der Volksschule, m. (Halle.)
Preussische Lehrerzeitung, d. (Spandau.)
Preussisches Volksschularchiv, 4 nos. (Berlin.)

Secondary.
Blätter für höheres Schulwesen, m. (Berlin.)
Blätter für das Gymnasialschulwesen, m. (Munich.)
Das humanistische Gymnasium, q. (Heidelberg.)
Die Mädchenschule, m. (Bonn.)
Die Mittelschule und höhere Schulen, m. (Leipzig.)
Frauenbildung, m. (Leipzig.)
Gymnasium, f. (Paderborn.)
Monatschrift für höhere Schule, m. (Berlin.)
Lehrproben und Lehrgänge aus der Praxis der Gymnasien und Realschule, q. (Halle.)
Süddeutsche Blätter für höhere Unterrichtsanstalten, q. (Stuttgart.)
Zeitschrift für lateinlose Mädchenschulen, f. (Halle.) (Berlin.)
Zeitschrift für das Gymnasialwesen, m. (Berlin.)
Zeitschrift für die Reform der höheren Schulen, q. (Berlin.)
Zentralorgan für die Interessen des Realschulwesens, m. (Berlin.)

Training of Teachers.
Archiv für deutsche Lehrerbildung, m. (Jena.)
Jahrbuch für Seminaristen und Präparande, a. (Gross-Lichterfelde.)
Pädagogische Blätter für Lehrerbildung und Lehrerbildungsanstalten, m. (Gotha.)

Special Subjects.
Monatsblätter für den Katholischen Religionsunterricht an höheren Lehranstalten, m. (Cologne.)
Zeitschrift für den evangelischen Religionsunterricht. (Berlin.)
Die neueren Sprachen, 10 nos. (Marburg.)
Zeitschrift für den französischen und englischen Unterricht, 6 nos. (Berlin.)
Geographische Zeitschrift, m. (Leipzig.)
Zeitschrift für geographischen Unterricht, m. (Leipzig.)
Natur und Schule, Zeitschrift für den gesamten Naturkundlichen Unterricht aller Schulen, m. (Leipzig.)
Zeitschrift für mathematischen und naturwissenschaftlichen Unterricht, 8 nos. (Leipzig.)
Zeitschrift für den physikalischen und chemischen Unterricht, 6 nos. (Berlin.)
Blätter für Knabenhandarbeit, m. (Leipzig.)
Die Stimme, m. (Berlin.)
Monatschrift für Schulgesang, m. (Essen.)
Musikpädagogische Blätter, m. (Quedlinburg.)
Der Zeichenlehrer, m. (Stuttgart.)
Der Kunstgarten, q. (Berlin.)
Die Kreide, m. (Berlin.)
Zeitschrift des Vereins der deutschen Zeichenlehrer, 33 nos. (Gross-Lichterfelde.)
Deutsche Turnzeitung, m. (Berlin.)
Gesunde Jugend, 6 nos. (Leipzig.)
Internationales Archiv für Schulhygiene, q. (Munich.)
Jahrbuch für Volks- und Jugendspiele, a. (Leipzig.)
Körper und Geist, f. (Leipzig.)

Educational Psychology.
Kinderfehler, Zeitschrift für Kinderforschung, 6 nos. (Langensalza.)
Pädagogisch-psychologische studien, w. (Leipzig.)
Sammlung von Abhandlungen zur psychologischen Pädagogik, 5 nos. (Leipzig.)
Zeitschrift für angewandte Psychologie, 6 nos. (Leipzig.)
Zeitschrift für pädagogische Psychologie der Sinnesorgane. (Leipzig).
Zeitschrift für pädagogische Psychologie, Pathologie und Hygiene, 6 nos. (Berlin.)
Zeitschrift für pädagogische Psychologie und experimentelle Pädagogik, m. (Leipzig.)

France:—

Annuaire de l'Enseignement commercial et industriel, a. (Paris.)
Annuaire de l'Instruction publique, a. (Paris.)
Annuaire de la Jeunesse, a. (Paris.)
Bulletin administratif du Ministère de l'Instruction publique, w. (Paris.)
Bulletin de l'Enseignement technique, f. (Paris.)
École nouvelle, m. (Paris.)
Éducateur moderne, 10 nos. (Paris.)
Éducation, q. (Paris.)
Enseignement mathematique, bm. (Paris.)
Enseignement secondaire, f. (Paris.)
Enseignement secondaire des jeunes Filles, m. (Paris.)
Enseignement supérieur libre. Bulletin de l'Institut Catholique de Paris, 10 nos. (Paris.)
Journal d'Éducation populaire, q. (Paris.)
L'École des Communes, m. (Paris.)
Le Journal des Instituteurs, w. (Paris.)
Le Volume, w. (Paris.)
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JOURNEYS, SCHOOL. — See **Excursions, School.**

JOWETT, BENJAMIN (1817–1893). — Teacher, theologian, and educational reformer. He was born in Camberwell, London, of a family which sprang from near Bradford, Yorkshire; and as a boy was addicted to private study showing exceptional mental precocity. Jowett attended St. Paul's School, London, 1829–1835, under Dr. Sleath, who pronounced him the best Latin scholar whom he had ever sent to the University. At school Jowett learned by heart large quantities of Greek and Latin poetry and formed the habit of retranslating into the classics passages which he had previously translated into English. In 1835 he gained an open scholarship at Balliol and came into residence at the University, October, 1836. Among his contemporaries as scholars of Balliol were Dean Stanley, Stafford Northcote (afterwards Lord Iddesleigh), and Dean Lake of Durham. Among the Fellows of the College at the time were Tait (afterwards Archbishop) and W. G. Ward. Jowett won the Hertford (University) scholarship in 1837, and in 1838 was elected Fellow of Balliol while still an undergraduate. He took a First Class in Literæ Humaniores in 1839. He graduated B.A. in 1839, M.A. in 1842, and in the latter year was appointed to a tutorship in Balliol College, a post which he held for the following twenty-eight years. He took deacon's orders in the Church of England in 1842, and priest's in 1845. Brought up in evangelical opinions, Jowett was plunged at Oxford into the midst of the Tractarian Movement and was greatly attracted by W. G. Ward (see Oxford Movement). In 1844 he took a leading part on the side of toleration of religious opinion in the University. He now became acquainted with G. Hermann Becker and Ewald, and other famous German scholars. Hegel's writings fascinated him. He gradually turned to the study of Plato, to which he devoted a large part of his life.

For many years theology was his chief occupation. An intimate friend of A. P. Stanley, he undertook an edition of St. Paul's *Epistles* and threw himself with vigor into the agitation for university reform. He wished to retain the college system, but favored an increase in the number of professors. The claims of the poor student found in him a strenuous advocate. With what he called the "gentleman heresy" of university life he had no sympathy. He gradually became recognized as an authority on questions of public education. In 1855 he was appointed to the Regius Professorship of Greek in the University. His supposed heterodoxy roused against him much theological opposition, which for a time deprived his chair of a greatly needed addition to its trifling endowment. As Professor of Greek, Jowett lectured on the *Republic* of Plato and the early Greek philosophers, and by his devoted attention to his pupils, not only those of his own college, won for himself an abiding place in the affection of the rising generation. In 1860 his article on the interpretation of Scripture, when published in *Essays and Reviews,* excited once again the anger of his theological opponents. The controversy deepened his spiritual insight and caused him for a time to "hold his tongue about theology."

His tutorial labors in college were immense. At one time he saw every undergraduate in Balliol once a week. His remarkable influence is attested by the long list of distinguished and devoted pupils who received their inspiration from him, and by the stamp which he set on Balliol. From 1865 onwards he devoted much time to the organization of education both in college and in the university. Intercollegiate lectures were arranged. He urged the necessity of lessening the expense of an Oxford career. He established a hall for poor students. He took an active part in the rebuilding of the college. He tried to enlarge the area from which the University drew its students. Elected to the Mastership of Balliol in 1870, Jowett redoubled his energies both for the enlargement of the college and for the extension of its usefulness, devoting to this work a large part of his private means. He interested himself in the development of university and secondary education in other parts of England. The University College at Bristol (now the University of Bristol) owed its foundation in large measure to him. He encouraged the study of Oriental languages in Oxford by candidates elected to the Indian Civil Service. He greatly improved the health of Oxford by taking an active part in the better drainage of the Thames valley. He encouraged the drama and music in Oxford. During a brilliant Vice-Chancellorship he helped in developing the system of university extension and was chiefly responsible for the erection of the examination schools in the High Street, an important addition to the mechanism of university life.

In 1871 his translation of Plato was published, and later years were largely given to its revision for a second edition. No ordinary translation, this book contained a series of essays and commentaries which comprised the wisdom of a studious and active life. He also completed translations of Thucydides and of Aristotle's *Politics*. No Oxford teacher had a more brilliant circle of pupils or greater influence upon public affairs. He died in October, 1893, and was buried in Oxford.

Jowett's study of Plato had a profound influence upon his educational ideas. It was Plato who confirmed him in the belief that "education comprehends the whole of life and is a preparation for another life in which education begins again." It was Plato who encouraged him to press on men and women the duty of self-education in later life. In Bacon's words, Jowett asked counsel of both times — of the ancient time what is best, and of the later time what is fittest. Those whose privilege it was to work with him in public affairs can never forget the quickness of his insight, his grasp of detail, his courage in action, his indifference to academic hesitations, his severe self-command. With him mere information had been distilled into wisdom. His speech had always the "salt of circumstance," though his plans were touched with a secret idealism. He wrote no systematic treatise on pedagogy, but he was a master of the science and art of education. A hard worker himself, he hated loafing. But he knew that most men can only profitably give a few hours of intense application to their daily studies. Therefore he encouraged moderate athletics. He was a loyal friend of physical science and urged its study in the university. But he was no partisan of scientific as against literary, or of literary as against scientific, studies. He had reached the synthesis where the two are joined in one discipline. He was, perhaps, a little blind to some of the subtler evils of the system of competitive examination, which he did so much to generalize. He knew that examinations are necessary. He had seen the mischief caused by their absence, the danger of dilettante studies, the necessity for most men of a punctually recurring intellectual audit. But perhaps he did not foresee the danger of a too great development of the examination system. As a tutor, his way of teaching was to compel self-knowledge and to excite interest rather than to satisfy it. He disliked sentimentalism. He had Dr. Johnson's hatred of exaggeration and conceit. He had a great idea that the welfare and prosperity of the nation depended on the upbringing and education of the young men of station and ability who would be called upon to bear part in public life. To poor scholars he was a sincere and munificent friend. He was proud of the fact that the success of Balliol had been due to the Fellows having always preferred public interests to private ones. He was a sincere believer in the virtues of college life. But there was nothing monastic in his view of college training. He did not aim at making specialists, but men of affairs, men who would serve God in Church and State. It may be said of Jowett what he said of Plato, that "he had many sides of wisdom, and he was not always consistent with himself, because he was always moving onward and knew that there are many more things in philosophy than can be expressed in words, and that truth is greater than consistency." He would have said of himself, as he said of his master, Plato, that his teaching was "half playful, yet having a certain measure of seriousness."

M. E. S.

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JUDGMENT. — This term is employed in a larger and more vital sense and in a narrower and more formal one. In its pregnant sense it means the act (or the power) of weighing facts or evidence, in order to reach a conclusion or decision; or (as is usual with words denoting acts) the result, the outcome of the process, the decision reached by the process of reflective inquiry and deliberation. In this sense judgment expresses the very heart of thinking. All thinking is, directly or indirectly, a part of the act of judging, of forming an estimate or valuation after investigation and testing. The difference in the adequacy of different cases of thinking is due to the care and thoroughness with which the operations of critical summoning and weighing of evidence are performed. The evaluating nature of judgment and its relation to a reasonably reached, intellectually valid conclusion, are suggested by the judicial procedure from which the word "judgment" is derived. There is primarily something at issue, at stake, something which is as yet undetermined, uncertain, but which needs to be decided. Without a crisis of uncertainty of this sort, without a questionable or problematic situation, there would be no judging. Then there follows the calling and hearing of witnesses, presenting all the facts relevant to settling the matter — that is to say, there are the processes of observation, recollection, etc., which bring in the data or evidence upon which a correct decision depends. Then there is the sifting, comparing, classifying, and relating operation by which is determined the respective force, the authority, to be assigned to this fact or that. This weighing or evaluating process involves the use of the general rules or principles bearing upon cases of this sort that have been established in prior experience. Finally the judgment issues in a decision, or declaration that the case is thus and so, within certain limits of probable error. From this sketch it is evident that judging involves in individualized concrete form all the operations of thinking or reflective inquiry, both material and formal: that is, the material operation by which facts are gathered and the formal one by which the facts are weighed and their meaning determined. From the standpoint of logical analysis, existence and meaning are thus the defining traits of every judgment.

The central position occupied by the training of judgment in the scheme of education is obvious. It may be explicitly stated by calling up to view the errors involved in failing to give it a central position. In brief, these consist, on one side, in the amassing of mere information, through observing and memorizing material which is put to no intellectual use; and, on the other, in merely formal exercises in reasoning apart from consideration of subject matter. In contrast with these counterpart errors, judgments involve the gathering of facts, but also the use of reasoning to compare, contrast, place, and interpret the subject-matter. Only where these two processes are combined (corresponding to the interrelation of existence and meaning) is there any training which is of value either for the practical deliberations of life or for the theoretical pursuit of science. Conditions that work against in the training of judgment are, accordingly, such procedures as the following: The multiplication of isolated sense observations, as in some schemes of object lessons and sense training; the multiplication of logical analyses apart from their bearing on reaching a conclusion; attaching great importance to correct reproduction of things previously learned without employing that material in pursuing some further inquiry; attaching importance to correct results or "answers," quite apart from the mental operations by which the results were reached; exercises where the material and methods are externally dictated, with no opportunity for the employment of judgment in selecting, arranging, and testing; methods in which mechanical skill, automatic rapidity, and accuracy are set above reflective inquiry — as in many so-called "drill" exercises; methods in which opportunity to commit errors is mechanically excluded, or in which, when committed, they are externally corrected without throwing upon the pupil any intellectual responsibility.

In its narrower and more technical sense a judgment is a statement of a relation between two objects, or between two contents of thought, two meanings. This is the meaning which the term "judgment" has gradually assumed in formal logic; from its standpoint the vitally practical meaning of judgment just expounded is sometimes contemptuously looked down upon as merely psychological in character. From the standpoint of judgment proper the actual operation of thinking as performed in life, the formal statement of a relationship *in abstracto,* is one important stage in the development of a controlled judgment. It marks a summing up, a gathering together of the net outcome of prior reflections. Such formulations are indispensable factors in the adequately performed vital judgment. Because the function of formulation is so important, judgment is not unfrequently identified with the statement of relations, or with the *proposition* (*q.v.*). J. D.

JUNGE, FRIEDRICH (1832–1905). — A German teacher; became prominent through his reform of the methods of nature study in the German schools. Born of an extremely poor family in a small village in Holstein, he prepared for the teaching profession at Segeberg, a seminary of his native province. From his earliest youth he was greatly interested in the study of nature, and when, as a man of forty, he received a position as a teacher in Kiel, he improved his opportunities by attending lectures in zoölogy and botany at the university, and by working in the laboratories and museums. As the fruit of these studies and of his long experience in the schoolroom he published, in 1885, his *Dorfteich als Lebensgemeinschaft* (*The Village Pond, a Biological Community*), which was read with great interest by teachers all over Germany. In this work he condemned the current methods of nature study, which aimed at mere systematization, and introduced the observation of communities of organic beings, both plants and animals, living under the same conditions and dependent on each other and on their environment. The child's interest was to be aroused by studying the life of an organic community which was near to him, such as the village pond, the meadow, the forest, the swamp, etc., proceeding thence to more remote organic communities, and finally to the aim of all nature study, a clear and sympathetic insight into the unity of all life in nature. F. M.

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JUNGIUS, JOACHIM (1587-1657). — German scientist and schoolman; was born in Lübeck, and studied at the universities of Rostock and Giessen. In 1609 he was appointed as professor of mathematics in Giessen. Three years later he was ordered by his sovereign, the Landgrave Ludwig V of Hesse-Darmstadt, to investigate the new method of teaching promulgated by Ratke (*q.v.*). He published a very favorable report about the work, in which, among other things, he advocated instruction in the mother tongue. When Ratke was called to Augsburg in 1614, to put his method into practical operation, Jungius followed him there. The result of the experiment, however, proved disappointing, and Jungius returned to his native city of Lübeck in 1615. The following year he again entered the University of Rostock, this time as a student of medicine. He remained for three years, and then went to Padua, where he obtained the degree of Doctor of Medicine. Returning to Rostock, he founded there, in 1622, a scientific society (*naturforschende Gesellschaft*), the first in Germany and in the whole north of Europe, "for the purpose of investigating truth through reason and experience, of freeing from sophistry all arts and sciences which are based on reason and experience, and of promoting them by happy inventions." He thus became one of the first representatives of Baconian ideas in Germany. In 1628 he was called to Hamburg as director of the Johanneum; there he remained until his death. Among his friends were Comenius and Hartlib (*qq.v.*). Jungius was a pioneer in Germany in insisting on a truly scientific method of studying nature by means of experiments and induction. He applied his principles chiefly to physics and to botany. In botany he anticipated some of the ideas of Linnæus on the classification of plants. F. M.

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JUNIATA COLLEGE, HUNTINGDON, PA. — An institution founded in 1876 as the Brethren's Normal School and Collegiate Institute, the present name being adopted in 1896. An academy, college, school of education, Bible and music schools, are maintained. The entrance requirements to the college are equivalent to fourteen points of high school work. The college course of four years leads to the degree of A.B. The faculty consists of twenty-three members.

JUNIOR COLLEGE. — A term used by the University of Chicago, the University of California, and a few other institutions of higher learning to designate that part of the four-years' college course embraced in the freshman and sophomore years, the college course being thus divided into a junior college of two years, and a senior college of two years. The outline of instruction, or the requirements as to work and electives, vary in the two divisions, being more largely prescribed in the lower division than in the higher. One object of the division is to make a separation between what is pure college work and what is the beginning of university work; another is to form a basis for the radiation of professional instruction, beginning with the junior year; another is to encourage small colleges of limited endowment to limit their work to that of the junior college, and then make the transfer of their students easy by admitting them to the senior college; and another is to encourage the larger and better equipped high schools to gradually add a thirteenth and a fourteenth year to the high school course of instruction, and thus stimulate the building up of junior colleges in the larger cities. The term has thus, by transfer, also come to mean a two years' course of instruction beyond the four-year high school, and a number of city school systems to-day speak of having the first year, or both years, of a junior college. The legislature of California in 1906 authorized cities to establish such course of instruction, covering two years beyond the ordinary high school course, and a number of city high schools have now added one year, and a few are planning to add two years. A number of colleges in the Mississippi valley have entered into junior college relations with the University of Chicago. With the rapid increase in students in the larger colleges and universities; with the rapid growth of city school systems in equipment and in the ability to provide advanced instruction; and with the shrinking of the endowments and income of the smaller colleges, relatively if not actually, the junior college idea is likely to make much more rapid progress in the next decade than it has in the past. E. P. C.

JUNIOR NORMAL SCHOOLS. — These are in a sense a revival in a new form of the old six-weeks summer normal institute, common thirty to forty years ago. These new schools are conducted under better auspices and embrace a more definite outline of instruction. Nebraska offers a good illustration of the new movement. This state first founded such schools nearly ten years ago and has so far provided for the establishment of eight such schools. The term of instruction is six weeks in length, and the session is held at some time during the three summer months. The instructors for each such school are selected and the course of instruction is outlined by the Board of Education for the normal schools of the state. County superintendents of schools in adjacent counties may declare any week of the term of the junior normal to be the institute week for their county, and appropriate their institute fund to assist in its maintenance. The different schools are supported from state and county institute funds. A few other states, such as Idaho and Louisiana, have analogous summer institutes. The six-weeks summer sessions of the regular state normal schools is a step farther in advance, as in such cases the normal schools have the buildings, equipment and teachers of the regular school for the work of instruction. E. P. C.

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History of Junior Normals; in *Rept. Supt. Publ. Instr. Nebraska*, 1906, pp. 68–78.

JUNIOR REPUBLIC. — See George Junior Republic.

JUNIUS, ADRIAN (c. 1512–1575). — A learned Dutch scholar, of great repute for his knowledge in physic, classical writers, history, philosophy, and in modern languages. Had he lived, it was proposed to give him a professorship in the new university at Leyden. He was born at Hoorn in Holland. He pursued his studies at Haarlem, Louvain, Paris, and Bologna, and in the last-named university took the degree of M.D. He traveled in Germany, and lived in England 1543–1548.

He settled finally as a physician at Haarlem, where he was head of the College. He was a man of great erudition, and had a prodigious memory. The following are his chief educational works: —

(1) Edited books of Ausonius, Cassius (animal medicine), Eunapius, Hesychius (*Lexicon*), Juvenal, Lucan, Martial, Nonius, Marcellus, Plautus, Plutarch, Seneca, Virgil. (2) Edited an *Epithetorum . . . Epitome* of J. Ravisius, usually called Textor. (3) *Adagiorum Centuriæ VIII cum dimidia. Basiliæ; Froben*, 1558 [an addition to Erasmus' Collections of *Adagia*]. (4) *Emblemata*, 1565. (See Emblems, and Mr. Henry Green in his reprint of Whitney's *Choice of Emblems*, p. 250). (5) A *Greek-Latin Lexicon*, with dedication to Edward VI, 1548. (6). *Nomenclator*, 1557, in Latin, Greek, German, Dutch, French, Italian, Spanish. This work was translated into English by J. Higins, London, 1585. The *Nomenclator* is a dictionary of all necessary words arranged not alphabetically, but grouped under subjects. Adrian's *Nomenclator* is, therefore, a forerunner of J. A. Comenius' *Janua Linguarum*, but without the descriptive sentences. There are many in common, *e.g.* living creatures, animals, fishes, all kinds of food, trees, vegetables, apparel, buildings, parts of ships, tools, terms in war, games, money, the elements, God and spirits, handicrafts, trades, affinities, etc. The *Nomenclator* is thus clearly a source of the *Janua Linguarum* of Comenius, though the form was suggested by the Jesuits' (Salamanca) *Janua Linguarum*. It may also be mentioned that Eilhardus Lubinus (*q.v.*) in his *Epistolary Discourse* before his edition of the New Testament refers to this work of Junius, and Brinsley (*q.v.*) in 1612 recommends the repetition of a few words daily out of the *Nomenclator*. F. W.

JUNKIN, GEORGE (1790–1868). — First president of Lafayette College, graduated at Jefferson College in 1813. He engaged in the ministry; became interested in agricultural education; conducted the Manual Labor Academy at Germantown (1830–1832); was president of Lafayette College (1832–1841 and 1844–1848); president of Miami College (1841–1844); professor in Washington College (1848–1860) and Lafayette College (1865–1868). Author of several works on religious education. W. S. M.

JUSTIN MARTYR (110–165 A.D). — The earliest Christian apologist and the first Christian after the original Apostles whose writings are known with sufficient fullness to enable us to form a clear picture of him and his system. He was born in Shechem of heathen parentage and received a thoroughly Greek education with added advantages of foreign travel. He became familiar with a wide range of Hellenic culture and has left, in the opening pages of his *Dialogue with Trypho*, an interesting description of his studies and philosophical experiences. He was successively a Stoic, a Peripatetic, a Pythagorean, and a Platonist. After his conversion to Christianity, he saw no reason to forego the pursuit of philosophy nor abandon the distinctive dress of a philosopher. He simply embraced the Christian religion as the true philosophy. He did not break with philosophy, nor regard it as the enemy of Christianity, but rather as the handmaid of the truth. At Ephesus and at Rome, where he resided for some years, he held himself ready for discussion with every comer and devoted himself to the defense and dissemination of the Christian faith, drawing to himself many pupils and disciples who afterwards became famous champions of the cross. He was at once a philosopher and a saint. He used the dialectic method in the spirit of Socrates, but his mental attitude was distinctly Platonic. His apologetic method appeals strongly to men of the present day. While the Antonines were reigning as "philosophers," he was building up a great new system of Christian philosophy which could fearlessly appropriate everything that had ever been rightly said and done as its own and throw the light of revelation over the doubts and contradictions of the past. His writings are of the utmost value, not only as apologetical and theological treatises, but also as pictures of Christian life and thought before the Canon of the New Testament was completed, the main outlines of which are luminously drawn by him. His *Dialogue with Trypho, the Jew,* modeled after the dialogues of Plato, contains all the vital points of Christian theology, and is a defense of Christianity as the successor of Judaism and of the Christian interpretation of the Old Testament. His *Apology*, addressed to the Emperor in defense of his fellow-Christians, is the noblest representative of early Christian literature. He wrote an essay on psychology in which he differed radically from Plato and the Greek philosophers on the nature of the soul. W. R.

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JUSTINIAN. — See ROMAN EDUCATION.

JUVENCUS, CAIUS VELTIUS AQUILINUS. — A Spanish priest of noble family, who composed a poem in four books consisting of about 800 hexameters in each book. The name of this Latin poem was *Historia Evangelica*, written about the year 330 A.D. Juvencus is the first of the conspicuous Christian Latin poets. " The [classical] lyric no longer existed, the mythological epic had been sung out, and an epic treatment of the New Testament was a new and daring undertaking to be approached only in a spirit of reverence especially as regards the subject matter." (J. T. Hatfield's *Study of Juvencus*). The story of the gospels is given in hexameters, closely following the old Latin version of the Bible, though at points in the New Testament Juvencus evidently has consulted the original Greek. The closeness of his following of the Scripture text has taken away from any possibility of originality of treatment of the subject matter. He especially follows St. Matthew, and ends his story where St. Matthew ends his. Juvencus is of importance as an early experiment in imitation of a classical model. He takes Vergil as a model, and as Dr. Hatfield's minute study of Juvencus shows, " the direct citations include every book of the *Georgics* and *Æneid*, and not a few passages in the *Eclogues*. . . . He never quotes entire more than half a verse and this but rarely." The combination of Christian subject matter directly from the gospels and the close imitation of Vergilian style made Juvencus a popular educational work in the Middle Ages, a popularity which continued into the sixteenth century. Colet in drawing up the Statutes for St. Paul's School, 1518, requires that the boys be taught specially in " *Christyn authors* that wrote theyre wysdome with clene and chaste laten other in verse or in prose," and specifically names Juvencus (with other authors) to serve as school authors to be read.

The preface or prologue to the *Historia Evangelica* should be mentioned as rising to a higher level of poetic inspiration. In it Juvencus speaks of the transitoriness of all earthly material things. Nevertheless, men are celebrated through long ages for their deeds and lives, and poets who celebrate these deeds themselves reap fame. The glory of Homer and of Vergil is eternal. Juvencus' song is the life and work of Christ. Even the fires which will destroy this world will not touch that, and perchance, even Juvencus' book with such a subject will save him from the fire, and he ends with a prayer for divine assistance to speak worthily on his great theme. This desire of fame is a forecast of the early Renaissance spirit. F. W.

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JUVENILE DELINQUENCY, JUVENILE COURTS, AND JUVENILE PROBATION. — " Juvenile Delinquency " is a term generally used to refer to the conduct of children of all ages when it runs counter to the public standards of propriety. The term has also a legal and technical meaning, as defined in the penal law of New York State since Sept. 1, 1909, which says that a child between the ages of seven and sixteen who commits any act or omission which in the case of an adult would be a crime not punishable by death or life imprisonment shall be deemed guilty of juvenile delinquency and punished in the same manner as an adult would be for the same offense except when the law provides specifically other punishment for children under sixteen (L. 1909, ch. 478, New York). The object sought by the New York law, which is similar to that in other states, is to relieve children who commit minor offenses from the stigma and disabilities of a public record of crime so as to give them the maximum chance and encouragement to make their future conduct normal. The criminal law now very generally holds children under seven incapable of committing crime in the legal sense, and a child between seven and fourteen years of age is entitled to the presumption of innocence of a guilty knowledge that he was doing wrong, though at this age *mens rea*, or intent to do a criminal act, may be shown by evidence and the child held to full responsibility.

It is less than a century since the attitude of the laws of England and the United States, and the practice of the courts in condemning and sentencing very young children to barbarous penalties for trivial offenses revealed little knowledge of the mental life of children and less regard for their possible reformation.

Through association with hardened criminals and every form of vice during the period of police custody, court proceedings, and subsequently in jails and prisons when under sentence, the record reads like a deliberate attempt on the part of the State to manufacture criminals. Happily a very different effort is now made in all civilized countries, based on a better understanding of the psychology of child life and a better appreciation of the environmental factors in fixing responsibility for crime, which has for its aim reformation and prevention rather than punishment. Now every possible device is sought to keep the child away from the contaminating influences of police methods, criminal court procedure, jails, and prisons, and to deal with juvenile delinquency through the educational machinery of a children's court, with its special juvenile probation officers, and with the coöperation of parents, school authorities, and all public and private agencies dealing with children. Only a beginning has been made and the change in purpose necessitates so many new adjustments which only time can bring about that doubtless much of our present achievement in dealing with juvenile delinquents will seem to future generations to fall as far short of justice to the child as the record of the past looks dark and dreary to us.

Character and Extent of Juvenile Delinquency. — Very trivial offenses may constitute delinquency, and the present tendency in juvenile legislation is to enlarge the scope of the law in order to bring conduct that may easily lead to more serious crime under preventive and probational control. Thus the Colorado law includes under delinquents persons under sixteen years of age charged with visiting saloons, jumping on moving trains, wandering aimlessly about the streets at night or about railroad yards, using vile or obscene language, associating with immoral persons, as well as those who violate state laws and city or village ordinances. Truancy is usually dealt with in the first instance by the truant officer or by the school authorities, and therefore does not appear often in court cases. For the entire country it would doubtless appear numerically near the top of the list of offenses charged against juvenile delinquents.

Owing to the varied and changing definitions of the law, no general or comparative statistics of juvenile crime throw any satisfactory light on the most frequent forms of juvenile delinquency.

The following table gives a summary of the business of several of the more important and best organized juvenile courts, covering the year 1908, as taken from a report of Miss M. Z. Doty to a subcommittee of the New York Child Welfare Exhibit. The figures are approximate and not comparable because of the different bases of organization and procedure in the different courts, but they serve to show the aggregate number of children coming before these courts, and something as to the probable serious or trivial character of the conduct that brought them into court.

Juvenile Courts	Total	Sent to Reformatories	Put on Probation	Sent to Homes for Neglected Children	Released[1]
New York City	11409	1722	1649[2]	554	7501
(Manhattan, Bronx, Brooklyn)	4475	776	648	216	3061
Chicago . . .	3751	772	1679	1025	255
Columbus, O. .	1200	154	331	276	273
Indianapolis . .	1760	100	289	26	310
Milwaukee, Wis.	926	86	544	97	199

[1] Paroled. There was no probation system in Manhattan in this year.

[2] Includes those acquitted, suspended sentences, and dismissed cases.

Juvenile Courts	Dependents Total	Delinquents			
		Total	Minor Acts	Criminal Acts	Other Offenses
New York . .	2400	9000	6000	2000	1000
Brooklyn . . .	539	1198		1198	
Chicago . . .	1650	2100	500	1000	600
Columbus, O. .	400	785	235	200	350
Indianapolis . .	80		270	306	100
Milwaukee . .	170	770	160	460	150

Dr. G. Stanley Hall gives a remarkable summary of the record evidences of juvenile faults, immoralities, and crimes in *Adolescence* (Vol. I, ch. 5, pp. 325–410), which gives data for many countries and presents many considerations of value concerning the nature and character of juvenile delinquency. In New York City two thirds of the cases brought into the Children's Court were technically charged with violation of section 720 of the penal law, which in effect makes playing baseball in the city streets or any form of annoyance in public places and on public conveyances a misdemeanor. The majority of cases in the children's courts of other cities which children are summoned for, or charged with, like minor offenses, more often reveal changes in the natural environment of the child and the absence of proper provision for the natural, and, under slightly changed conditions, harmless acts of normal child life rather than a depraved or inherently criminal disposition.

A recent study of delinquent children brought to court in Chicago during the first ten years from June 1, 1899, when the first juvenile court in the United States was established in Chicago, to June 30, 1909, covered a total of 14,183 children, about equally distributed over the ten years. Of these, 11,413 were boys and 2770 were girls. Up to 1905 the court had jurisdiction only of children under sixteen years of age, but a change in the law that year gave the court jurisdiction up to seventeen for boys and eighteen for girls. Among the boys 22 per cent were fifteen years of age, 18.6 per cent were fourteen years, 14.6 per cent thirteen years, and 13 per cent twelve years of age. The largest number of girls range from fourteen to seventeen inclusive, with the maximum per cent 26.3 at fifteen years.

An analysis of the offenses which were the cause of these children being brought to court is interesting, and shows that more than half of the delinquent boys were charged with violation of rights of property (" stealing from the railroad " heads the list; stealing money comes second; junk, third; shop-lifting, fourth; breaking into empty buildings, fifth; stealing from parents, stealing and driving away with horse, motor, or bicycle, stealing gum, fruit, candy, or tobacco, stealing pigeons, ducks, stealing newspapers and miscellaneous thefts follow in due order). A careful study of these cases led the investigator, Dr. Breckinridge, to comment: " Without minimizing the dangers into which a boy may be led, it seems clear that a considerable number of these acts are not vicious, but are performed in a spirit of harmless adventure and without realization of their possibly serious consequences."

Next after stealing, to which is credited 50.8 per cent of the offenses, comes incorrigibility (21.7 per cent), disorderly conduct (16.2 per cent), malicious mischief (6.5 per cent), vagrancy (2.3 per cent), immorality (1.6 per cent), dependent charges, — drunkenness of parents, lack of care, etc. (.8 per cent), truancy (.7 per cent), miscellaneous offenses (1.4 per cent). This makes the total 102 per cent. Two per cent represents cases counted twice; that is, brought into court under two different charges. The total number of cases brought into court was 11,641.

Of the girls (2770) the offenses are classified as follows: stealing (15 per cent), incorrigibility (42.8 per cent), immorality (31.4 per cent), disorderly conduct (6.7 per cent), malicious mischief (.2 per cent), vagrancy (.1 per cent), dependent charges (3.3 per cent), miscellaneous (.1 per cent), not reported (.4 per cent). The charge of immorality is somewhat different from that in the case of boys, and usually signifies that the girl has been going in bad company, or in the street day and night, or has a bad reputation, or is staying away from home in company with vicious people, is strongly suspected of being immoral, or is charged with using vulgar and obscene language. Every effort is made to protect girls from the charge of immorality, and where the evidence is not clear the offense charged is usually incorrigibility.

In the treatment of the cases just cited 59.3 per cent of the boys and 37.5 per cent of the girls were put on probation. Twenty-one and three tenths per cent of the boys and 51.5 per cent of the girls were committed to institutions, and 16.9 per cent of the boys and 10 per cent of the girls were cases continued indefinitely or dismissed, while the remaining cases (2.5 per cent boys and 1.4 per cent girls) were disposed of otherwise.

Another interesting fact in connection with the analysis of these Chicago cases shows that 67.9 per cent of the boys and 79.7 per cent of the girls appeared in court only once in this ten-year period, while 86.2 per cent of the boys and 96.7 per cent of the girls were in court twice or less.

Causes of Juvenile Delinquency. — Much may be inferred as to causes of juvenile delinquency from what has been said as to its character and extent. Specific and convincing statistical evidence is not available, but recent studies of cases that come before juvenile courts in the large cities indicate that environmental conditions play the largest rôle. Congestion in living quarters, the absence of playgrounds or any outlet for normal physical activities of youth, inadequate or ill-adapted schools, and commercialized amusements which exploit the normal desire for recreation, taken collectively constitute a group of environmental conditions which in the large city play havoc with the growth and development of childhood.

Parental neglect and irresponsibility plays, perhaps, the second most important rôle. This in turn is attributed in part to the long working day of the father, to widowhood, and to conditions of poverty that require the mother to be away from home at work either for long hours or at hours when the children are free from the control or supervision of the school. The juvenile court as a public agency to deal with delinquent and neglected children has been extended to cover neglect, and in many states, as originally in Colorado, the parent or parents or legal guardian who is responsible for, or by any act encourages, causes, or contributes to the delinquency of the child is guilty of a misdemeanor. This enables the court to bring the parent into court on a charge directly connected with the delinquency of the child, and by suspending sentence the parent can practically be made the agent of the court to carry out the sentence of the court under the superintendence and direction of the court.

Poverty and dependence would seem to be responsible for a great deal of delinquency if we regard the records of the court as its sole measure. Many persons believe that children ought not to be brought into court at all on a charge of destitution or poverty, and it is certain that the courts are always embarrassed to know how to deal with such cases, which would seem more properly to belong either to private charities or to officials of the poor law than to juvenile courts. Definite commitments to institutions in the case of orphan children or of children who must be taken from their parents because of improper guardianship would still have to be settled in a court of justice and should of course be put within the jurisdiction of a juvenile court.

Treatment of Juvenile Delinquency. — *The Juvenile Court.* — The movement for separate courts for children began in Massachusetts in 1869, and although measures were taken to secure them, no progress was made. The idea was, however, adopted in Adelaide, South Australia, in 1898, and soon after this example was copied in Toronto. As now known, the first juvenile court in the United States was organized in Chicago in 1899, and is now an institution very generally found in the larger cities of the country, as an adjunct of their judicial system. It has spread as an institution very rapidly even beyond the borders of the United States, and is now recognized in England and throughout Europe as a distinctive American contribution to social administrative progress. In many places, as in New York City, it is grafted upon the regular judicial system. In Manhattan, the New York Children's Court, as it is called, is known as the children's part of the second division of the Court of Special Sessions. Two of the judges of the Court of Special Sessions sit in turn, three months at a time, in the Children's Court, and it has its regular quota of court officials and police officers. Until recently it had no probation officers, but agents of the Society for the Prevention of Cruelty to Children acted as official investigators and parole officers of the court; now there are eighteen probation officers. The procedure of the court is that of the criminal court, with slight modification depending upon the attitude and personality of the judge on the bench. This is not a good sample of what the Children's Court ought to be, as conceived by those who regard it as a new device for handling children in a new way without necessarily implying any new legal principles or any radical changes in our jurisprudence.

The model juvenile court seeks to express a new attitude of society toward juvenile delinquency which will make the welfare of the child and the good of the State sufficient grounds on which to base the right of the court to control the custody of the child and to permit the court, if necessary, to take the child from its natural parents or guardians, provided its welfare is the determining factor. The juvenile court thus becomes, not an instrument for prosecuting a criminal, for the juvenile delinquent henceforth is not to be regarded as a criminal, but the agent of the State for the purpose of protecting and conserving a great and fundamental interest of the State, which is the well-being of each individual child whose well-being for any cause is not properly safeguarded by its natural protectors or guardians.

The juvenile court, organized as part of the administrative machinery of the government, can also serve to bring into effective coöperation for the better protection of the child and the improvement of its surroundings through probation and other proper methods and court procedure every child-helping resource of the community, — parents, teachers, social workers, playgrounds, neighborhood centers, settlements, churches, and institutions of all kinds. It can secure for the child a physical examination and proper treatment for physical defects. It can do all of these things under the continuous and wise supervision of the court authorized at any time to intervene on behalf of the welfare of the child and exercise the full compelling authority of the State. The courts of last resort have construed the laws creating juvenile courts so as to uphold this broad exercise of power on the ground that this is a power which has been used from earliest times by the English chancellors, who in some of the oldest cases held that the right to take a child from the custody of its parents existed where the father ill-treated or was cruel to infant children, was drunken or debauched, or whose domestic relations tended to corrupt and contaminate his children.

To separate the child offender from the adult criminal, to make the court an agency for rescue as well as punishment, and to bring home to the parent a realizing sense of the great responsibility for the wrong-doing of his child, and to avoid the necessity for commitment of children to jail, — are among the prime objects of the juvenile court.

England through the Children's Act of 1909 (see CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF) has made provision for juvenile courts by authorizing the appointment of special children's magistrates, and while, as yet, little progress has been made in providing different rooms or buildings from those in which other sittings of the court are held and thus giving to the juvenile court a distinctive character of its own, the legal machinery exists, and only a more liberal construction of the act by the home office is necessary to accomplish this result.

A great deal depends on the physical machinery of the juvenile court for its best success. A separate building constructed on different architectural lines from the traditional courthouse and separated from the machinery associated with police arrests and prosecuting methods is desired. Even in densely populated areas the impossibility of providing separate courts in sufficient numbers to be readily accessible for all the children suggests the further necessity of creating some local agencies other than police courts for hearing and sifting minor complaints, sending only the more serious ones to the children's courts.

The existing practice in many communities of assigning the regular judges and using the regular courthouse for part time in the work of the children's court may be an intermediate step to an improvement on existing methods where there is no children's court, but it is not to be commended as a solution of the difficulties or as a way of achieving the aims of a proper juvenile court. The detention house, or a place where children may be kept in custody pending trial or investigation of their cases, or for brief periods of necessary confinement, is an important adjunct of the children's court, and should differ as much from the ordinary jail as the children's court is different from the regular court. The essence of juvenile court procedure, however, consists in a proper system of probation.

Juvenile Probation. — The New York Probation Association defines probation as a means of disciplining and seeking to improve offenders without committing them to correctional institutions. This is applied both to children and adults in New York State, and now in many jurisdictions. The " fine " system is rapidly losing favor, especially in dealing with children, where the parent invariably paid the fine and was the one punished, or the child went to jail in default of payment and was put under influences likely to instil or develop criminal tendencies. Some method of treatment that will restrain children from continuing in evil ways and at the same time help them to overcome bad influences and encourage them to attend school regularly, keep away from harmful places and unfit companions, and conduct themselves with some regard for the rights of others is so universally needed, and probation, properly safeguarded in a way to secure appointment of efficient probation officers, so admirably meets this need, that its adoption is spreading rapidly. Massachusetts enacted the first probation law in 1878, which for two years applied only to Boston, then to the entire state, and both to juvenile and adult offenders. Illinois, Minnesota, and Rhode Island were the next states to adopt probation laws in 1899, more than twenty years after Massachusetts had pointed the way. New Jersey and Vermont followed in 1900, which brought the list up to six states, but by the end of another decade (1910) thirty-eight states and the District of Columbia applied probation to children, and twenty of these states to adult offenders.

The principles of probation are simple, but their application difficult. So much depends on the personality of the probation officer. In many places such officers are appointed as part of the spoils system in politics, and even where, as in very few cases, civil service appointments are made, it is difficult to secure competent persons and to get adequate appropriations for the payment of enough probation officers so that efficient work can be done without overburdening the probation officer with more cases than he can handle with due regard to the delicate nature of the work and thoroughness in its execution. Several states, like Massachusetts and New York, have provided for state supervision of probation work through a state probation commission, and in this way secure more uniform and better results.

Volunteer and unpaid probation officers are relied upon in some communities to perform such work. They can be used as aids to public salaried officers, devoting their whole time to their professional duties. The paid probation officer serving as a public official under state supervision is essential to secure the best results, and the volunteer can best serve as an aid and supplementary force. The expense of the probation system is not large, and when considered in relation to the saving in the cost of maintenance where persons are put in jails or public institutions, it is a real economy. The " Big Brother " movement was started in 1904 by the Men's Club and Bible Class of the Central Presbyterian Church of New York through the efforts of Mr. Ernest K. Coulter, Clerk of the Children's Court of Manhattan, to secure a Protestant probation officer to look after Protestant children in the court as Jewish and Catholic children were being looked after by representatives of their own religious bodies. The idea of the movement is that a man shall take one boy, make a friend of him, and help him and his family in any way he can, that is, be " a big brother " to him. The proper assignment of boys from the court to the most suitable persons among volunteer big brothers, the securing of records and reports of what is done with the boys and the instruction and guidance of big brothers demands a central organization and supervision which has led to the incorporation of a board of directors. The coöperation of the Y.M.C.A. and the part use of its plant for big brother boys has been secured and plans have been considered to organize the movement on a national scale, but thus far it has been difficult to get sufficient financial support to test fully its possibilities. A woman's auxiliary known as the " Big Sisters " has been started to deal with girls.

Recent Legislation. — The statutes enacted in 1910 on probation, juvenile courts, adult contributory delinquency and dependency, and juvenile detention homes are cited by chapter and date in the report of the New York Probation Commissioners for 1911, while similar statutes for earlier years are given in previous reports of that commission. In 1910 adult contributory delinquency laws were enacted in Virginia, Rhode Island, New York, and Kentucky, while the probation system was extended or adopted for the first time in the District of Columbia, Kentucky, Louisiana, Massachusetts, New York, Vermont, and Virginia, and statutory provision for detention homes was enacted in Maryland and New Jersey. S. M. L.

See CITIZENSHIP, EDUCATION FOR; CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF; HUMANE EDUCATION; PENOLOGY, EDUCATIONAL ASPECTS OF; REformatory Education; Social Justice and Education; Children, Criminality in; Education and Crime; Attendance, Compulsory; Moral Education; Religious Education.

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KALAMAZOO COLLEGE, KALAMAZOO, MICH. — A coeducational institution, chartered as the Michigan and Huron Institute, in 1833, and later changed to the Kalamazoo Literary Institute. For a few years following 1837 the school was affiliated with the University of Michigan. In February, 1855, the institution was chartered as a college. Women were, from the first, admitted on equal terms with men. A theological seminary originally planned was early abandoned. The Board of Trustees is a self-perpetuating body of thirty-six, elected in three classes, one class being chosen each year to serve three years. There are no fraternities. Presidents of Kalamazoo College have been: the Rev. J. A. B. Stone, 1855-1863; John M. Gregory, 1864-1867; the Rev. Kendall Brooks, 1868-1887; the Rev. Monson H. Wilcox, 1887-1891; Theodore Nelson, 1891-1892; and Arthur Gaylord Slocum, 1892. The institution maintains undergraduate courses leading to the bachelor's degrees in arts, and science; the entrance requirements are fifteen units. The degree of A.M. is given for one year's graduate study in residence. Grounds, buildings, and equipment are valued at $142,000. The productive endowment is $460,000, yielding an annual income of $22,000. There are (1912) thirteen members of the instructing staff. The enrollment, in 1911-1912 was 186. C. G.

KANSAS CITY UNIVERSITY, KANSAS CITY, KAN. — A coeducational institution established in 1896 under the auspices of the Methodist Protestant Church. It includes Mather college, college of theology, college of music, Kansas City Normal School, Wilson High School, school of elocution and oratory and Kansas City Hahnemann Medical College. Students are admitted on meeting the entrance requirements of fifteen units. The degrees of A.B., B.S., Ph.D., and B.L. are conferred. The degree of B.D. is conferred in the theological department, for which the entrance requirement is the A.B degree. The faculty consists of fifty-six members, of whom forty have the rank of full professor. In 1910-1911 the enrollment of students was 445, of whom thirty were in the college, sixty-eight in medicine, and thirteen in theology. The faculty consists of fifty-six members.

KANSAS STATE AGRICULTURAL COLLEGE, MANHATTAN, KAN. — An institution organized in 1863 as a result of the Morrill Land-Grant Act of Congress of 1862, and by the donation to the state of the grounds, buildings, and equipment of Bluemont Central College, founded in 1858. The college offers facilities for a liberal or a technical education. The faculties include 186 professors, instructors, and assistants, organized into four divisions or schools, viz. Division of General Science, Division of Agriculture, Division of Mechanic Arts, and Division of Home Economics. Fourteen four-year courses, each leading to a degree, are offered in the several divisions. Graduate courses lead to the master's degree. Preparatory courses are offered, and also short courses of twelve to four weeks each, in agriculture, dairying, and domestic science. A department of college extension employs a staff of fifteen specialists, who devote their whole time to extension work consisting of lectures, farmers' institutes, social center work, rural education, correspondence courses, and highway, bridge, and drainage engineering. An agricultural experiment station with a central station at the college and four branches had an annual budget for 1911 of $102,500. An engineering experiment station conducts investigations of engineering problems. The campus consists of 160 acres, and the experimental farms of 5130 acres. The college has twenty buildings devoted to instruction and laboratory purposes. The library contains 60,000 volumes. The total budget for 1911 amounts to $563,000. The enrollment of resident students for 1910–1911 was 2407.

KANSAS, STATE OF. — First organized by Congress as a separate territory in 1854, and admitted to the Union as the thirty-fourth state in 1861. It is located in the north central division, and has a land area of 81,700 square miles. In size it is about the same as that of Minnesota and one third larger than all the New England states. For administrative purposes the state is divided into counties, and these in turn into cities and school districts. In 1910 Kansas had a population of 1,690,949 and a density of population of 20.7 per square mile.

Educational History. — The Jesuits were the first teachers in the territory, opening schools at a number of places for the instruction and conversion of the Indians. A white school was opened at what is now Kansas City, in 1844, but the school which is usually regarded as marking the beginning of free schools in Kansas was opened at Lawrence in 1855.

Four constitutions were prepared by different parties and conventions, viz. in 1855, 1857, 1858, and 1859. The constitution of 1859 was finally accepted by Congress on the admission of the state. In each of the four constitutions, provision was made for a state system of education, and somewhat similar provisions with reference to education were contained in each of the four. In 1855 school trustees were required to report to the Secretary of State.

In 1857 a territorial superintendent of schools was appointed to look after the school lands, though little was done toward the opening of schools before 1859. In 1858 county superintendents were provided for, but the office was abolished the next year. In 1860 township trustees were directed to divide their townships into districts and the district system was definitely established. For each district three teachers and an inspector were to be elected for one-year terms. During 1861 reports show that the schools in existence were mostly subscription schools or private enterprises; no state aid was granted that year and only twelve counties made any returns as to schools. A law providing for a state one mill tax was enacted in 1861. In 1862 reports from twenty-eight counties were received. Between 1855 and 1860 as many as eighteen universities and ten colleges were chartered by the legislature, only three of which survived, two of the three becoming state institutions.

In the constitution of 1859 definite provision was made for a State Superintendent of Public Instruction and for county superintendents; for the preservation of the school lands and for a board of school fund commissioners; and for the establishment of a state university and the preservation of its funds. The educational provisions of the 1859 constitution have remained unchanged to the present time. After the settlement of the slavery difficulties, the eastern portion of the state began to fill up, and the increase in population was still more rapid after the close of the Civil War. The number of original school districts in 1865 was 222; in 1866 it was 986; and in 1870 it was 2068. In 1863 the first teachers' institute was held, and the State Teachers' Association was organized. In 1863 Lawrence University, chartered in 1859, became the State University of Kansas (*q.v.*); Bluemont College, chartered in 1858, became the Kansas State Agricultural College (*q.v.*), and the bill establishing a state normal school was signed. In 1864 the issuance of bonds for school buildings was first authorized, and the State Superintendent was directed to hold a teachers' institute in each senatorial district in the state. In 1868 the holding of teachers' institutes was changed from one in each senatorial to one in each judicial district. In 1869 the examination of teachers was taken from the county superintendents and given to a county board of examiners of three, of which the county superintendent was the chairman. In 1870 a district tax for library purposes was authorized. In 1870 a second normal school was established at Leavenworth; in 1872 one was established for colored students in connection with Quindaro University; and in 1874 a third school was established at Concordia. In 1876 the appropriations for all schools were cut off, and all but the one at Emporia were definitely abandoned. The land endowment saved Emporia, and appropriations for it were resumed a few years later. In 1873 the State Board of Education was created and given power to examine teachers for state certificates. In 1877 a four-weeks teachers' institute was made obligatory in each county, and the control of the institute was transferred, in part, to the county superintendent. About 1870 the movement for public high schools began, and in 1885 the State University abandoned its preparatory department, after which the development of high schools was rapid. In 1897 a state textbook commission was provided for; in 1899 high school books and school supplies were also to be adopted; and in 1901 it was made unlawful for any one to offer to sell to trustees any book, map, chart, or piece of apparatus not approved by the commission and having a minimum price fixed by them.

In 1903 an efficient compulsory education law was enacted, and an extra tax for industrial training authorized. In 1905 the State Board of Education was given power to prescribe a course of study for the schools of the state; a good child labor law was enacted; and a tax for county high schools was provided. In 1907 educational requirements for the office of county superintendent were added.

In 1909 normal training in high schools and academies was provided for, and $50,000 state aid voted for this purpose; the school land laws were revised; the Barnes high school law validated, and provision was made to license business colleges to canvass for students in the counties. The legislation of 1911 was the most important enacted by any legislature. The minimum term was raised from five to seven months, and state aid granted to weak districts; the standards for certification were to be increased gradually, and the State Board of Education given power to name and to increase requirements; consolidation of districts, and the provision of transportation were made easier; city boards of education were reduced in number, and made elective at large; township high schools were authorized; the high school normal training law of 1909 was extended and grants for agricultural instruction added; free high school tuition for rural pupils was provided; joint county institutes were permitted; and the salaries of county superintendents were materially increased.

Present School System. — At the head of the school system of the state is a State Superintendent of Public Instruction, a State Board of Education, a Board of School Fund Commissioners, and a School Textbook Commission. The State Superintendent is elected by the people for two-year terms. He has general supervision and management of the educational interests of the state; gives official opinions to the county superintendents; prepares all blanks and forms, and edits the school laws biennially; visits each county biennially, and makes a biennial report to the Governor; apportions the school fund to the counties; and advises with the county superintendents as to the time and place of holding their normal institutes, and the selection of an institute conductor. The State Board of Education consists of the State Superintendent, the Chancellor of the University of Kansas, the President of the State Agricultural College, the President of the State Normal School, and three schoolmen, appointed by the Governor with the consent of the Senate and for two-year terms. This Board meets at its own pleasure, and its chief function is to prepare uniform examination questions for use in the county examinations; to examine teachers for state certificates and state diplomas; to approve colleges and normal schools, both within and without the state, and place them on the accredited list for the exemption of their graduates from all or part of the state examinations; and to prescribe standards for the certification of kindergarten and manual training teachers, and to prescribe the course of instruction in manual training schools.

The State Superintendent together with the Secretary of State and the Attorney-General constitute the Board of Commissioners for the management and investment of the state permanent school fund, the normal school fund, and the university fund. The State Superintendent is Secretary of the Board. All school districts issuing bonds must first offer them at par to the Commission, thus insuring that all the school funds may be kept safely invested all the time.

The School Textbook Commission consists of the Superintendent of Public Instruction, *ex officio*, as chairman, and eight persons, appointed by the Governor for four-year terms, the Senate approving, and not more than five from the ranks of any one political party. This Commission adopts a uniform series of textbooks for the elementary and high schools of the state, and fixes the price at which they may be sold. Maps, charts, globes, and apparatus must be similarly adopted and a minimum price fixed. Any city, town, or district may vote to furnish free books to its pupils, but the use of the adopted books is made obligatory upon all.

For each county there is a county superintendent, elected by the people for two-year terms. He is required to visit schools; keep detailed records of many kinds; make quarterly and annual reports to the State Superintendent; apportion the school moneys to the districts; determine and change school district lines, and discontinue depopulated districts; hold an annual normal institute of four weeks in length; divide his county into from one to five truancy districts and nominate a truant officer for each to the county commissioners; to open schools, employ teachers, and levy a school tax sufficient to maintain five months of school in case school directors fail or refuse to do so; and to act as agent and supervisor of the orphan and reform school pupils indentured in his county, visiting each twice a year and reporting as to their condition and progress. For his services he receives a salary of from $600 to $1800 a year, varying with the school population of his county. The county superintendent together with two competent persons, holding high-grade teachers' certificates and appointed by him, constitute the county board of examiners. This board conducts quarterly examinations, using questions prepared by the State Board of Education, and grants four grades of county teachers' certificates. Cities of the first and second class are exempt from the county examinations, and any school district employing ten or more teachers may have its own board of examiners and examine its own teachers. Holders of state certificates and normal school certificates are exempt from such local examinations.

The counties are divided into school districts, each having a district board, consisting of a director, a clerk, and a treasurer, each elected for three-year terms. Cities having a population of 15,000 or over constitute cities of the first class and are governed by boards of education of six members elected at large. Cities of from 2000 to 15,000 population constitute cities of the second class, and are governed by boards of education of six members also elected at large. Cities of 250 to 2000 people constitute cities of the third class, but, unless provided for by special law, these are governed as school districts. The treasurer of the board has charge of the money of the district or city, and the clerk keeps all records and makes an annual report to the school meeting and to the county superintendent. An annual school meeting is provided for, and its powers set forth. The annual meeting of the district may by vote, if the county superintendent concurs, discontinue its schools, and pay an adjoining district to teach its pupils for one or more years, and still retain its integrity as a district; or it may vote to annex the district to an adjoining district or city, or to consolidate its schools with those of one or more other districts.

School Support. — The state originally received the sixteenth and thirty-sixth sections (2,801,306 acres) for common schools; two townships (46,080 acres) for a university; 90,000 acres for an agricultural and mechanical college; and 30,380 acres of salt lands for a normal school. The common school lands have been sold and a permanent common school fund of $8,500,000 has been built up. So large is the number of school children in Kansas that the income from this fund is worth only about ninety cents per census pupil, five to twenty-one years of age, per year. It is apportioned to the counties and from the counties to the districts semiannually on this basis. The one-mill state tax enacted in 1861 was later repealed. Strong efforts have been made within the last ten years to secure a new state school tax, but so far they have been unsuccessful. The university lands have produced an endowment of $145,000; the agricultural college lands, $500,000; and the normal school lands, $270,000. The chief reliance of the schools is on local taxation, which may go up to 4½ mills. District boards must levy up to that rate if necessary to maintain a seven months' school. Cities may also levy local taxes for schools up to 6 mills if of the first class, 9 mills if of the second class. All cities and districts may, in addition, levy a tax of from ½ to 1 mill for industrial training, and ½ to 2 mills additional for library purposes. About 85 per cent of the total expenditure for education comes from local district taxation.

Educational Conditions. — Of the total population, about 95 per cent are white and 90 per cent are native born. The foreign born are largely English, German, and Swedish. There are few cities in the state, and about 75 per cent of the total population live in rural districts.

Since 1903 the state has had a good compulsory attendance law, and since 1905 a good child labor law. Each county is divided into from one to five truancy districts, and a truant officer is appointed to see that the law is enforced. Cities form independent truancy districts. In 1900 Kansas stood third in the percentage of literates (2.9 per cent) in the total population, Iowa and Nebraska alone having less. The estimated value of the school property of Kansas is $18,000,000, or an average of about $1900 for each schoolhouse in the state. Since 1903 the state has offered aid for industrial instruction (manual training and domestic science), duplicating any amount raised and expended up to $250 a year in each place. Separate schools for the colored race are not permitted except in the cities of the first class and the high school at Kansas City, Kan., but a recent report of the State Superintendent recommends such change in the law as will permit of their establishment.

Teachers and Training. — About one fourth of the teaching force each year is composed of inexperienced teachers, and about 80 per cent are teaching on second and third grade county certificates. About 5 per cent are normal graduates. For the training of these, and the improvement of those in service, a teachers' normal institute, of not less than four weeks' duration, must be held in each county each year. Adjacent counties may combine for a union institute. The time and place of holding the institute, as well as the institute conductors to be employed, must be approved by the state superintendent, and all conductors must be certificated for the work by the State Board of Education. A State Teachers' Reading Circle, under the direction of a board chosen by the county superintendents' section of the State Teachers' Association and with the State Superintendent as *ex officio* Chairman of the Board, outlines a course of reading each year for the teachers of the state, and all examinations for state teachers' certificates must include reading circle work as one of the examination subjects. For the training of new teachers, the state maintains three normal schools, and has made extensive provision for normal training classes in the high school of the state, with annual state aid.

Secondary Education. — The law provides for three kinds of high schools, — district, union, and county. Cities and single districts may establish a high school for their own children, which must be maintained out of the ordinary district funds. Counties may establish county high schools for all the children of the county, by election and majority vote, and levy a special county high school tax up to six mills for the support of the same. Any two or more school districts may vote to unite to form a union for the purposes of providing higher instruction, in which case each district maintains its separate schools and the union district is a separate superimposed district, with power to levy regular district taxes, but the share paid by each district is in proportion to the number of children attending the union district. The support of all high schools is by local taxation, except that, since 1905, any county not maintaining a county high school may vote to levy a general county high school tax of from one fourth to three mills on all county property except that cities of 16,000 inhabitants or over are exempt, and to apportion the proceeds of such tax *pro rata* among the different high schools of the county in proportion to the average daily attendance in each. Pupils in non-high school districts in the poorer counties are provided with free tuition in adjacent high schools. State aid is granted for normal training classes ($500) with $250 additional if they also offer courses in agriculture and domestic science.

Higher and Special Education. — The University of Kansas (*q.v.*), opened in 1866, and the State Agricultural College (*q.v.*), opened in 1863, are the two higher institutions maintained by the state. In addition to these two state institutions, eighteen denominational colleges offer higher education within the state.

College	Location	Opened	Control	For
Highland University	Highland	1857	Presb.	Both sexes
Baker College	Baldwin	1858	M. E.	Both sexes
St. Benedict's College	Atchison	1858	R. C.	Men
Ottawa College	Ottawa	1865	Bapt.	Both sexes
Washburn	Topeka	1865	Cong.	Both sexes
St. Mary's	St. Mary's	1869	R. C.	Men
Bethany	Lindsborg	1881	Luth.	Both sexes
Emporia	Emporia	1883	Presb.	Both sexes
Kansas Wesleyan University	Salina	1886	M. E.	Both sexes
Southwest Kansas College	Winfield	1886	M. E.	Both sexes
Midland College	Atchison	1887	Luth.	Both sexes
Cooper College	Sterling	1887	U. Pres.	Both sexes
Fairmount College	Wichita	1892	Cong.	Both sexes
St. John's Lutheran	Winfield	1893	Luth.	Men
Kansas City University	Kansas City	1896	Meth. Prot.	Both sexes
McPherson College	McPherson	1897	Ger. Bapt.	Both sexes
Friends University	Wichita	1898	Friends	Both sexes
Campbell College	Holton	1903	U. B.	Both sexes

Since 1899, the state has made special appropriations for the partial support of Western University at Quindaro, an institution founded for "freedmen" before the days of emancipation. The Governor also appoints a majority of its Board of Trustees, thus virtually making it a state normal, agricultural, mechanical, and domestic science school for the colored race. The state has similarly practically adopted the Topeka Industrial and Educational Institute, a western Tuskegee, and makes small annual appropriations for its partial support. The state also maintains the Soldiers' Orphans' Home at Atchison; the State School for the Deaf at Olathe; the State School for the Blind at Kansas City, Kan.; the Boys' Industrial School at Topeka; and the Kansas Industrial School for Girls at Beloit. E. P. C.

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KANSAS, STATE UNIVERSITY OF, LAWRENCE, KAN. — A coeducational institution forming part of the free public school system of the state, and established by act of legislature in 1864. Seventy-two sections of land had already been set apart for the purpose by Act of Congress in 1861. The institution was opened at Lawrence, the citizens of which provided the first building, in 1866. The law school was opened in 1878: the school of pharmacy in 1885; the school of engineering in 1891; in 1896 the graduate school was organized; and in 1899 a full school of medicine was instituted; in 1909 the school of education and division of university extension were added.

The government of the University is vested in a board of seven regents, six of whom are appointed by the Governor and who hold office for four years. The departments of instruction of the University are as follows: graduate, college, fine arts, law, pharmacy, medicine, summer session, education, university extension. The entrance requirements are fifteen units except in the medical school, where two years of college work are required, and in the law school, where, after 1912, one year of college work will be necessary. All the departments offer four-year courses leading to their appropriate degrees, except the law school, where only a three-year course is given leading to the LL.B. Advanced degrees, including A.M., M.S., and the Ph.D., are conferred for work in residence. The total registration in

1910–1911 was 2398. The teaching staff consists of 176 professors and 65 instructors and assistants.

KANSAS WESLEYAN UNIVERSITY, SALINA, KAN. — A coeducational institution founded in 1886 under the auspices of the Northwest Kansas Conference of the Methodist Episcopal Church. Academic, collegiate, normal, musical, commercial, and oratorical departments are maintained. Candidates are admitted on about eight points of high school work. On completion of the appropriate courses the degrees of A.B., Ph.B., and B.S. are granted. The faculty consists of forty-three members.

KANT, IMMANUEL (1724–1804). — The most important and commanding figure in the development of later modern culture, and the author of the intellectual and moral revolution which brought forward and fashioned a radical conception of the significance of humanity. He was born of humble parentage in Königsberg, Germany. The advantages that came to him in youth through his education during eight years in the *Collegium Fredericianum* were due to the devotion and wisdom of his mother, the material assistance of a maternal uncle, and the belief in his ability by the family pastor, F. A. Schultz, who was also a leader in the movement known as Pietism. Despite his poverty, he completed a course at the university in his native city (1740–1746), intending, as sometimes supposed, to prepare himself for the Church. This alleged purpose waned as he passed on in the acquisition of culture in many fields under the influence of Knutzen and Teske, professors of philosophy and physics, respectively. The following nine years were passed as a tutor in several families near Königsberg, and brought to him valuable personal and pedagogical experiences.

In 1755 Kant returned to the university, and, qualifying as a private lecturer in mathematics, physics, and philosophy, was destined to pass over forty years as an eminent teacher in this one institution. His six years' service as a librarian in the castle library after 1766 enabled him to expand his acquaintance with literature in all its branches. Having earlier declined the vacant chair of poetry, he was promoted in 1770 to the professorship of logic and metaphysics. His brilliant and popular lectures covered a wide range of subjects, as was then the custom of members of the philosophical faculty. Arnoldt's inquiry into the range and repetition of Kant's lectures is in itself an interesting sketch of his versatility. He lectured on logic 54 semesters, metaphysics 49, physical geography 46, moral philosophy 28, anthropology 24, theoretical physics 20, mathematics 16, natural right 12, encyclopedia of philosophy 11, pedagogy 4, besides on a number of other subjects. He created and gave academic standing to physical geography and anthropology, despite his lack of travel. His active teaching ceased in 1796, owing to the infirmities of age. By the exercise of strong will he overcame the physical weakness of his youth, and by regulating his daily life by principles he fashioned a character that is one of the noblest models of self-education.

Before Kant became the author of the revolutionary critical philosophy, his mental development carried him through several interesting phases. Equipped as a student with the Leibnitz-Wolffian philosophy, he turned his attention to the more scientific problems of the material universe. He held to the unity of the physical world, advocated a mechanical dynamism for the explanation of its phenomena, elaborated the nebular hypothesis to account for its origin, and gave foreshadowings of the conception of evolution (*A General Natural History and Theory of the Heavens*, 1755). These years were succeeded by a period of rather quiet and uncertain empiricism in which the influence of Hume and Rousseau seemed to impress him. The *Dreams of a Spirit-Seer explained by the Dreams of Metaphysics* (1766), was written apparently to show the impossibility of knowledge beyond experience.

In 1769 a "great light" came to him which brought out clearly the contrast between nature (to be explained by causality), and spirit (whose essence is to be found in morality and religion). In his inaugural dissertation, *On the Forms and Principles of the Sensuous and the Intellectual Worlds* (1770), he had advanced so far as to see that physical science and philosophical idealism are but two aspects of knowledge and reality which human experience unifies. In a letter to Herz (1772) there is the first definite intimation of the settling of the real problem that he tried to solve. Then followed the silent and lonely years of reflection which resulted in the *Critique of Pure Reason* (1781) and marked the beginning of the philosophical revolution that is still in progress. The new method of "criticism" shows the possibility of experience and science by discovering the *a priori* forms of space and time and the twelve categories possessed by reason, and by establishing the principle of human self-consciousness as the maker of nature and the unifier of experience. The subjective and synthetic basis of all truth of nature was made a basis for the objective and metaphysical value of morality as expressed in the "categorical imperative" of the *Critique of Practical Reason* (1788). The systematic rounding of his thinking was reached in the æsthetical and teleological principles of the *Critique of Judgment* (1790). The completeness of his attack on the problem of the unity of experience appears from the attempted harmonization of the three *Critiques* by giving a psychological foundation to the first in intellect, to the second in will, and to the third in the feelings. His service to philosophy became a harmonization of rationalism and empiricism, of dogmatism and skepticism in the method and results of "criticism," making possible the radical development of idealistic philosophy which greeted Germany within a decade after his death.

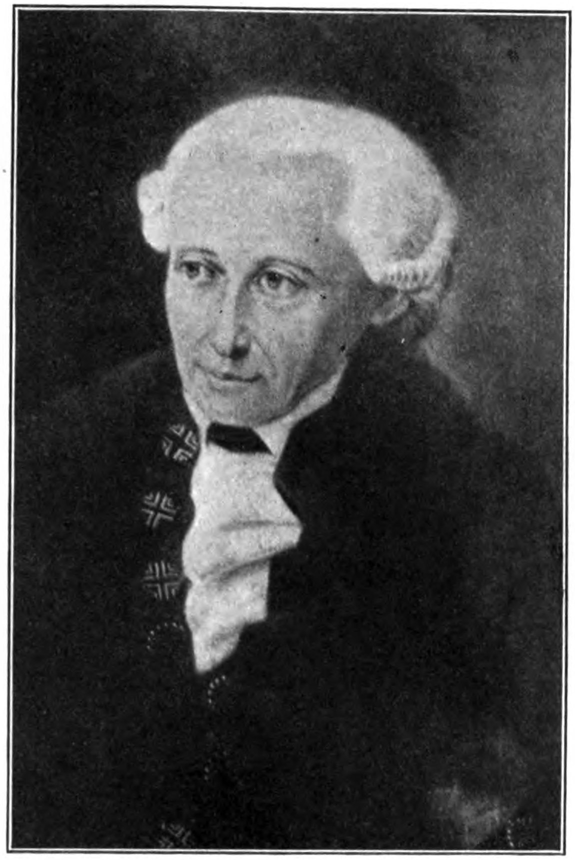
The influence of the critical philosophy grew slowly The less than thirty publications on it after three years grew to one hundred and fifty in five years, and fell but little short of three thousand books, pamphlets, and articles by 1804. Kant became the center of a contending mass of friends and foes. An anonymous philosophical book (by Fichte, 1794) was immediately attributed to him. Three years later Feder, who in an early review of the first *Critique* called him a Berkeleian and thus drew from Kant the *Prolegomena to Every Future Metaphysics that can appear as Science* (1783) and eventually the famous second edition of the *Critique* (1787), was on his own admission literally forced out of his chair of philosophy at Göttingen because he could not seem to understand the Königsberg philosopher. Important additional writings of Kant are: *Idea of a Universal History,* etc. (1784), *Fundamental Principles of the Metaphysics of Morals* and *Metaphysical Foundations of the Natural Science* (1786), *Religion within the Limits of Mere Reason* (1793), *The Metaphysics of Ethics* (1797), *Anthropology with Reference to Pragmatic Ends* (1798), *Logic* (1800), *Physical Geography* (1802), and *On Pedagogy* (1803), the last three being edited by two of his pupils.

Kant's contributions to education as a practice and a theory are to be sought in his long career as an effective teacher of the leaders of his country, his writings bearing directly on the subject, and the immeasurable influence of his epistemological and ethical thinking upon the cultural and technical thought of his own and succeeding ages. In later years he modestly doubted the value of his early efforts as a teacher of children, saying, "there could never have been a worse tutor in the world than himself, because he could not even apply those pedagogical rules which he knew." As an academic teacher he held his chief end to be "to promote right opinions, and to inculcate fixed principles in minds of native excellence, in order to afford the only proper direction to the development of talent." His high ideal demanded that students should be taught how to think, rather than given mere information. The famous tribute of Herder in 1792 to his teacher of thirty years before shows the rare command of knowledge ("nothing worth knowing was indifferent to him"), the well-developed technique of instruction, and the effective guidance of liberty in thinking which made Kant the great teacher.

Owing to an old university rule, which required of one of the professors public lectures on the subject two hours a week, Kant's formal attention to education was given chiefly in his lectures on pedagogy throughout four semesters between 1776 and 1787. This material, which never received systematic handling, was edited by Rink and published as *Ueber Pädagogik* (1803). It has since appeared in several German editions, and in one French and two English translations. Kant's interest in education as a topic for reflection probably awakened during the early years when Montaigne was a favorite author and Rousseau's writings riveted his attention, and continued to the end of his active career. He treated directly, however, of only a few questions in education. He drew chiefly on the memories of his own experiences as a teacher, and in part agreed with the pedagogy of the *Aufklärung* as it was expressed in Rousseau, Basedow, Campe, and others. In some of his views he characteristically departed from the positions of his contemporaries and set problems for the nineteenth century, chiefly in the evolutionary basis and the moral task of education.

Education is the greatest and hardest problem that is presented to man, because its purpose is the attainment of human destiny and perfection which consist in absolute moral worth. "Man can become man through education only." The history of the race shows progress through education toward the development of humanity. Since "there are germs in human nature" and the unfolding of "humanity from its seeds" does not take place of its own accord, education is the most necessary of all arts. A call for an effective rationalization of this art and for experimental schools is made at the same time that princes and parents are criticized for pursuing the defective aims of experience instead of "the good of the world and the perfection for which man is intended." As a principle Kant declares: "Children should be educated, not with reference to their present condition, but rather with regard to a possibly improved future state of the human race, *i.e.* according to the idea of humanity and its entire destiny." His conception of education includes its necessity, its possibility, its worth, its principles, its art, and its types. It is necessary, because of the great gap existing between the rawness of infancy and the human will organized into free action under law, and because nature alone does not educate. It is possible, because a "germinal reason and a quasi-germinal morality," as innate capacities, actually equip man for perfection. It has value, because of the absolute worth of goodness as human destiny. "It is morality alone which gives *meaning* to man, and at the same time puts an *end* into educational thought and effort." It is rational and involves principles, and we may therefore hope for a future science, wherein every activity in the artistic nature of teaching will be placed on a firm basis. Education is evaluated also according to types of schools, teachers, and methods.

The educational solidarity of the individual and the race is expressed not only in his wonder



Immanuel Kant (1724–1804). See p. 586.

Georg Wilhelm Friedr. Hegel (1770–1831). See p. 243.

Johann Friedrich Herbart (1776–1841). See p. 250.

Friedr. Wilhelm Christ. Karl Ferd. von Humboldt (1767–1835). See p. 340.

A GROUP OF GERMAN EDUCATORS.

"whether the education of the individual should imitate the development of the race in general through its various generations," but also in his insistence "that every phase of educational effort must proceed upon a recognition of the basis which natural and mechanical processes universally present, be it in physical, psychical, cultural, or moral education, in the constant endeavor to hand the child over to a free, rational, individual independence."

Kant's "treatise" on pedagogy was divided into two parts: *On Physical Education* (§§ 34-90) and *On Practical Education* (§§ 91-113). The former includes all natural or mechanical processes, the latter all that has reference to freedom. The development of the individual is conceived as requiring four types of educational activity: discipline, cultivation, civilization, and moralization. Discipline includes everything pertaining to physical nature, and attempts "to prevent the animal nature from becoming injurious to human nature," both individually and socially. Under cultivation are included instruction and teaching, which are designed to equip the individual with skillfulness as the means of executing a great variety of purposes. Civilization, which is not treated by Kant, leads to the acquisition of prudence, and the complete socialization of the individual. Moralization is the means of bringing the individual to "acquire that type of mind which chooses good aims only." He charged his age with developing the first three and omitting the fourth type of educational activity.

The antinomy between constraint and freedom haunted Kant constantly. He returns repeatedly to the question: "How shall I cultivate freedom under conditions of compulsion?" His only definite recommendation with respect to the plan of instruction was the introduction of "a catechism of right," an outline of which he furnishes in the *Metaphysical Elements of Ethics* (1797). The method proposed invites children to apply the moral law to concrete cases of conduct, and thus become conscious of it and accept it as the one obligatory principle of the will. Moral education differs in aim and in method from the cultural development of the mental capacities of the individual. The ethical conception of duty also became the basis for religious pedagogy. His insistence on freedom as the essence of man's intelligible character and the very opposite of causality as the key to empirical character greatly influenced the educational theory of the following century, as is instanced in Herbart's polemic against transcendental freedom, and its continuance by his followers.

Kant disapproved of a state scheme of education, because it was too narrow and misdirected. The development of humanity being the end of education, "the basis of its plan must be cosmopolitan". Princes also distort education by seeking merely to make men "citizens" who are to be used to further the immediate purposes of the State. His great interest in Basedow's philanthropic institute at Dessau was therefore due to his belief in this experiment as promising a way of true educational reform.

The philosophy created by Kant was itself a system full of pedagogical motifs by reason of its acute analysis of inner experience and its recognition of the creative power of pure reason. It also became fruitful in opening the current epoch of western thought in which the pedagogy as well as the philosophy of Fichte, Schelling, Hegel, Schopenhauer, Herbart, Schleiermacher, Schiller, Goethe, Niemeyer, Schwarz, and their numerous followers radiated throughout the nineteenth century. E. F. B.

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KAY-SHUTTLEWORTH, SIR JAMES PHILLIPS (1804–1877). — First Secretary of the Committee of Council on Education in England and Wales, was born at Rochdale, Lancashire, in 1804, the son of Robert Kay. As a boy he was employed in a bank belonging to a relation at Rochdale, but in 1824 entered the University of Edinburgh as a student of medicine, becoming M.D. 1827. He had a brilliant university course during which, both in Edinburgh and in Dublin, he studied the condition of the poor. After graduating he settled at Manchester as a physician and served as medical officer of the Ancoats and Ardwick Dispensary situated in one of the poorest and most crowded districts of the city. During the outbreak of cholera in 1832 he was devoted in his attendance at the cholera hospital. The experience gained during this epidemic and as secretary to the Manchester Board of Health impressed upon him the social danger of the insanitary surroundings of the poor. In 1832 he published a pamphlet entitled *The Moral and Physical Condition of the Working Classes Employed in the Cotton Manufacture in Manchester*, the disclosures of which led to local measures for sanitary and educational reform. He was an ardent supporter of the Anti-corn Law movement. He was appointed in 1835 Assistant Poor Law Commissioner, and for some years served in that capacity first in Norfolk and Suffolk and afterwards in the metropolitan district. As a Poor Law official he became more than ever convinced of the necessity of national educational reform. In 1839, when the Committee of the Privy Council for Education in England and Wales was first appointed, in order to administer the parliamentary grant for public education in Great Britain, Dr. Kay (as he was then called) was appointed the first secretary of the Committee, being allowed to retain for a time the superintendence of the metropolitan schools for pauper children under the Poor Law Board. He thus became the first secretary of the Education Department for England and Wales.

Hand in hand with his intimate friend and colleague under the Poor Law Board, Mr. Edward Carleton Tufnell (born at Chichester 1806, educated at Eton and Balliol College, Oxford, and subsequently director of Greenwich Hospital), Dr. Kay worked out a plan for establishing a training college for the preparation of teachers who would devote their lives to the care of hapless pauper children in the Poor Law Schools of Norwood. The condition of these children was deplorable. Kay and Tufnell conceived the idea of establishing a training college, the discipline and spirit of which should fit and inspire young men for this task of mercy and rescue. Their first step was to travel in Europe in order to acquaint themselves with the best that had been done in other countries for the professional training of teachers destined for the schools of the poor. After visiting Holland, Prussia, and France they went into Switzerland, attracted by what they had heard of the work of Pestalozzi (who had died in 1827) and of Fellenberg and Father Girard (*qq.v.*) who were still engaged in their educational work. Returning to England, Kay and Tufnell found premises at Battersea in West London. The house still forms the nucleus of St. John's College, Battersea. In 1840 the college was opened for the admission of students, the first pupils being some boys selected from the school of industry at Norwood in view of the excellence of their conduct and their intellectual promise. The period of instruction in the training school was to last for three years and to be followed by two years' employment as pupil teachers in the Battersea village school during three hours of every day. The new training college, which was maintained at the private cost of Kay and Tufnell, was cordially supported by philanthropists in all parts of the country and quickly grew into an institution of considerable size. The whole of the household work was committed to the charge of the boys and young men. The masters partook the same diet as the pupils. The aim was that the teacher of the peasant's child should himself be acquainted with the peasant's duties. In this, the first organized training college for men teachers in England, the first Secretary of the Education Department resided during the critical years in which he built up the administrative fabric of English public education under the supervision of the civil State.

The success of the college was great. In 1843 Kay (who had assumed the name of Kay-Shuttleworth on his marriage in 1842 with Janet, daughter and heiress of Robert Shuttleworth of Gawthorpe Hall, near Burnley) handed over the college to the committee of the National Society (*q.v.*), by whom it has been conducted with increasing usefulness, though with great modifications in its curriculum and mode of life, to the present day.

In the meantime Kay-Shuttleworth had thrown himself with vigor into the new work of the Education Department. On his appointment as Secretary, the Ministers of the Crown had given him a special injunction to assert the civil influence in education. The first steps were to propose (1) the establishment of a great training college for teachers, and (2) the inspection of all schools receiving government aid. The first of these schemes was wrecked by dissensions between the civil power and the ecclesiastical bodies on the subject of the religious instruction to be given in the college. The second part of the plan, viz. inspection, was entirely successful, the whole weight of the Benthamite tradition favoring the adoption of the plan. It was because the idea of a state training college broke down that Kay-Shuttleworth and his friend Tufnell determined to establish the training college at Battersea at their own expense. Their indomitable courage and personal self-sacrifice won the day. Established by private effort, the college became the first of a long succession of training institutions.

During the early years of his secretaryship, Kay-Shuttleworth proved himself brilliantly resourceful in administrative ideas. He persuaded the government to employ John Hullah to introduce a modification of the Wilhelm method (the fixed *doh* system) into the teaching of singing in elementary schools. It was an application of the Pestalozzian method of ascending from the simple to the general through a clearly analyzed series of steps. Hullah's efforts were extraordinarily successful. Kay-Shuttleworth also introduced Pestalozzian methods of the teaching of arithmetic and geography. He was also the first to insist upon the teaching of drawing as an indispensable part of elementary education.

In 1843 the Committee of Council, on Kay-Shuttleworth's advice, began to give regular grants in aid of (1) the erection of teachers' residences; (2) the purchase of school furniture and apparatus; and (3) the establishment of training colleges under the management of religious bodies or approved educational societies. This gave a decisive turn to English policy in regard to national education. The idea of a State monopoly in elementary education was definitely abandoned. Under Kay-Shuttleworth's influence the State entered into a partnership with the religious and voluntary associations for the improvement of the education of the poor. This concordat between the civil state and the religious or voluntary associations was the keynote of Kay-Shuttleworth's policy. In an eloquent pamphlet entitled *The School in its Relations to the State, the Church, and the Congregation*, issued anonymously with the sanction of the government, Kay-Shuttleworth expounded the policy of the new Minutes and vigorously defended the idea of a concordat between the State and the religious bodies against the secularist party on the one hand and the anti-governmental ecclesiastical writers on the other.

Owing to a breakdown of health from overwork, Kay-Shuttleworth resigned his office of Secretary of the Committee of Council in 1849. In the same year he was created a baronet. Recovering from his illness he devoted himself with ardor to public work. He was vice-chairman of the Central Relief Committee during the cotton famine in Lancashire, 1861–1865. He served on the Royal Commission on Scientific Instruction (Duke of Devonshire, chairman) from 1870–1873. His later years were occupied with reforming the administration of several local grammar schools, especially Giggleswick and Burnley. He died in London, 1877.

Kay-Shuttleworth was the true begetter of the modern English system of elementary education aided by the State. The training of teachers, public inspection of schools, the pupil teacher system, the combination of secular instruction with religious teaching and with liberty of conscience, and the synthesis of contributions from the government treasury and from local benefactors were prominent features of his plan, and all of them have persisted with modifications down to the present time. Matthew Arnold said with justice that, "when at last the system of English elementary education comes to stand fully and fairly formed, Kay-Shuttleworth will have a statue." He combined in his own person the administrative decision of the Benthamites, the philanthropic ardor of the sanitary reformer and the religious zeal of the Anglican statesman.

M. E. S.

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KAZAN, UNIVERSITY OF. — See RUSSIA, EDUCATION IN.

KEAGY, JOHN M. (1795–1837). — American advocate of the word-method of teaching reading. He was educated in private schools and graduated from the university of Pennsylvania in 1817. In turn he was principal of the Harrisburg Academy and the Friends' High School in Philadelphia, and professor in Dickinson College. He became interested in the work of Pestalozzi and his American disciple, Joseph Neef (*q.v.*), and became an ardent advocate of the word method of teaching reading in opposition to the alphabet method then in use. His educational writings include *Essay on English Education* (1824) and *Pestalozzian Primer, or First Steps in Teaching Children the Art of Reading and Thinking* (1827).

W. S. M.

KEATE, JOHN (1773–1852). — Headmaster of Eaton College from 1809–1834. He was educated at Eton and King's College, Cambridge, where he distinguished himself in classical scholarship. He graduated B.A. in 1796 and was elected fellow. In 1791 he was appointed assistant master at Eton and in 1809 became headmaster. His whole career was a struggle with the frequently turbulent and rebellious boys; disclipine was bad, and he suffered many indignities. Under such conditions the state of scholarship was poor. Keate's chief claim to fame as headmaster was his constant and wholesale use of the birch; on one occasion he flogged as many as eighty boys. Many stories are related of the flogging headmaster. He distrusted boys as much as Hawtrey and Arnold (*qq.v.*) relied on their sense of honor. Nor was the staff of masters of the standard of scholarship usually connected with good schools. In the end, however, Keate attained a measure of popularity and secured efficient assistants. He was able on his resignation to hand over to his successor, Hawtrey (*q.v.*), a better disciplined school than he had found. He sympathized with educational reforms, but the problem of discipline absorbed the greater part of his attention. He did encourage oratory and English composition and the establishment of debating and other societies. After his resignation he lived in retirement as rector of a country church.

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KEBLE, JOHN (1792-1866). — English poet and divine, born at Fairford, Gloucestershire, the son of a clergyman from whom he received his education until his entry into Corpus Christi College, Oxford. He obtained a fellowship at the early age of nineteen, after graduating with a double first. He was ordained in 1815 and remained at Oxford until 1823, when he became a parish priest. In 1827 he published the *Christian Year*, a collection of religious poems which attained a remarkable popularity. From 1831-1864 he was professor of Poetry at Oxford. In 1835 he became Vicar of Hursley in Hampshire. It is, however, with the "Oxford Movement" that Keble is most generally identified as one of its chief leaders and inspirers. Connected with this movement were his share in the *Tracts for the Times* and the translation of the Church Fathers (*Library of the Fathers*). Keble wrote many books on religious topics and in addition to the *Christian Year* was the author of *Lyra Innocentium* (1846), and *Prælectiones Academicæ* (1844), in which he discussed the theory of poetry. On state control of schools, which was suggested in his day, Keble took the stand that England "as a Christian nation was a part of Christ's Church and bound in all her legislation and policy by the fundamental laws of that Church." Keble College, Oxford, opened in 1870, was named in honor of Keble, "to the memory of one of the most eminent and religious writers whom the Church of England has ever produced, one whose holy example was perhaps even a greater power for good than his *Christian Year*."

See Oxford Movement.

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KEHR, KARL (1830-1885). — A German educator, born in Goldbach, Thuringia, and educated at the seminary at Gotha, where he was appointed teacher of pedagogy in 1863. In 1872 he became the director of the seminary, which position he later exchanged for a similar one at Halberstadt, and finally at Erfurt. Through his efforts in these positions, as well as through his numerous writings, he exerted a great influence on the training of teachers in Germany. His most important work is his *History of the Methods of Elementary Instruction in Germany* (*Geschichte der Methodik des deutschen Volksschulunterrichts*), published with the collaboration of a number of schoolmen in 1877. He was the founder of *Pädagogische Blätter für Lehrerbildung und Lehrerbildungsanstalten.* F. M.

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Wienstein, F. *Preussische Pädagogen der Neuzeit,* pp. 29-40. (Arnsberg, 1900.)

KEILHAU. — A village near Rudolstadt in Thuringia, Germany, the scene of Froebel's first school, which he established in 1816 for the education of his brother's children and others. Although founded in Griesheim as the *Allgemeine deutsche Erziehungsanstalt*, it was soon moved to Keilhau. Froebel was assisted by Wilhelm Middendorff and Heinrich Langethal; in 1823 they were joined by Johannes Arnold Barop, a nephew of Middendorff. Froebel left the institution in 1829. Under the influence of Barop, who became sole owner of the school in 1854, the institution gradually developed into a private boarding and secondary school. In 1870 the examination for the one year military service was held in the school for the first time. In 1878 Barop died and was succeeded by his son, Johannes Barop. In 1892 the Prussian curriculum for secondary schools was introduced, but the principles of Pestalozzi and Froebel remained, and the institution is still marked by the emphasis on the social and coöperative work. The school is now a Realschule with Latin as an optional subject. There are about 100 pupils. In 1896 an alumni association was formed. The present headmaster is Dr. Otto Wächter.

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KELLER, JOSEPH EDWARD (1827-1886). — Jesuit educator; educated at St. Louis University. He held professorships at St. Francis Xavier's College, Cincinnati, and St. Joseph's College, Bardstown, Conn. He was president of Woodstock College and provincial of St. Louis University. He was author of several religious and philosophical works. W. S. M.

KELLNER, LORENZ (1811-1892). — One of the most prominent Catholic schoolmen of modern Germany; born at Kalteneber, near Heiligenstadt, Prussia, and educated at the seminary of Magdeburg. After a few years' experience as an elementary teacher, he was appointed to a position in the newly founded seminary at Heiligenstadt, of which his father was the principal. From there he was called, in 1848, as school inspector to Marienwerder, West Prussia, and later on in the same capacity to Trier in the Rhine province, where he worked for thirty-one years until his retirement in 1886. For several years he was a member of the Prussian parliament. He published a large number of educational works and articles treating of the history of education, the methods of teaching the mother tongue, and other matters of pedagogical interest. Among these may be mentioned: *Erziehungsgeschichte in*

Skizzen und Bildern; Zur Pädagogik der Schule und des Hauses, etc. His autobiography, *Lebensblätter; Erinnerungen aus der Schulwelt,* is a model of its kind. F. M.

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Wienstein, F. *Preussische Pädagogen der Neuzeit,* pp. 13–28. (Arnsberg, 1900.)

KELLOGG, MARTIN (1828–1903). — University president, graduated from Yale College in 1850 and the Union Theological Seminary in 1854. He subsequently studied at the universities of Bonn and Berlin in Germany. He was professor in California College from 1860 to 1869, when this institution became the University of California, and continued as professor in the University of California to 1893, when he was chosen president of the institution (1893–1899). He was the author of several Latin texts and of numerous addresses on educational subjects. W. S. M.

See California, University of.

KELTIS, or CELTES, CONRAD. — See Renaissance and Education.

KENDRICK, ASAHEL CLARK (1809–1895). — College professor and textbook author; graduated from Hamilton College in 1830, and later studied at the University of Athens. He was tutor and professor at Colgate University from 1831 to 1850, and professor at the University of Rochester from 1850 to 1880. His published works include *Child's Book in Greek, Introduction to Greek,* and *Greek Grammar;* he also edited several of the Greek classics. W. S. M.

KENESIS. — See Tropism.

KENNEDY, BENJAMIN HALL (1804–1889). — One of the most brilliant classical scholars in England during the last century and headmaster of Shrewsbury School. He belonged to a family of distinguished scholars. When he entered Shrewsbury School in 1819, he at once attracted attention by the remarkable quality of his compositions, and while still at school he won the Porson Prize, one of the most important of the classical prizes at Cambridge University. In 1823 he entered St. John's College, Cambridge, and graduated B.A. with great distinction. After serving for a year as assistant master at his old school he was elected to a fellowship at his college in 1828. From 1830–1835 he was assistant master at Harrow and in 1836 he was elected headmaster of Shrewsbury. Here his first task was to reduce the school to discipline, which, as in most English public schools of the day, was somewhat lax. He also paid much attention to the housing accommodations, then in a very bad state through overcrowding. While laying chief stress on the classical studies, he introduced French and mathematics, geography and history into the curriculum, although little value was attached to any of these subjects and none counted for promotion. Another innovation was the institution of daily supervised preparation; athletics were encouraged; religious instruction and devotion were strengthened, and the establishment of a school choir encouraged an interest in music. In many ways Kennedy's reforms show the strong influence of Arnold (*q.v.*) at the neighboring school at Rugby. When the inhabitants of Shrewsbury claimed that the school was founded as a free school in the literal sense, Kennedy wrote a pamphlet, *Shrewsbury School, Past and Present* (1862), to prove that *Libera Schola Grammaticalis* meant a royally chartered school preparatory for the universities, a view which was proved to be baseless. (See Free Schools.) Kennedy was not only a remarkable classical scholar, but widely read in modern literature and history. As a teacher he was, in spite of his impulsiveness, eminently successful, and trained a large number of famous scholars. He had a remarkable ability in writing Latin verse, as may be seen in *Sabrinæ Corolla* (1850) and in *Between Whiles, or Wayside Amusements of a Working Life* (1882). His influence on classical teaching was exercised by his grammars, especially the *Public School Latin Primer* (1866) and the *Public School Latin Primer* (1871); he also edited a number of classical texts, including Vergil, the *Agamemnon* of Æschylus, and Sophocles' *Œdipus Tyrannus.* He resigned from the headmastership in 1866, and in the following year was appointed Regius Professor of Greek at Cambridge.

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KENTUCKY, STATE OF. — Originally a part of Virginia; organized as a separate territory in 1790; and admitted as the second new state in 1792. It belongs to the South Central Division, and has a land area of 40,000 square miles. In area it is practically the same size as Ohio or Virginia. For administrative purposes the state is divided into 119 counties, and these in turn into cities and towns on the one hand, and into educational subdivisions and subdistricts on the other. In 1910 Kentucky had a population of 2,289,905, and a density of population of 57 per square mile.

Educational History. — The first permanent settlement was made in 1774, and the first private school was opened at Harrodsburg in 1776. Other schools were opened, and private higher schools or academies were established at various places before 1800, but these schools were very primitive and elementary. In 1799 the foundation of a state university, to be known as Transylvania University, was laid by the union of Transylvania Seminary, established by Virginia in 1780, and Kentucky Academy, chartered by the Kentucky legislature in 1794. The institution for a long time remained but little more than an academy. Though a number of private and advanced schools existed in the different settlements, no general interest in education existed before 1820 at least. So far as there was any interest, it centered about the academies, but even they did not prosper, and their lands and funds were not infrequently mismanaged or squandered. The state constitution, adopted at the time of admission, and a second state constitution, adopted in 1799, contained no mention of education.

The first legislation with reference to education took place in 1798, when the legislature granted 6000 acres of land to each of three academies and two seminaries. In 1805 and 1808 acts were passed extending these provisions to all the existing counties. Permission to raise $1000 by a lottery was also given to each institution. By 1820 there were forty-seven county academies in operation, though they led but a precarious existence, and their failure as a system of education began to be recognized by this time. Between 1819 and 1829 six colleges were chartered, which were destined to compete with and eventually to ruin the chances of Transylvania University developing into a strong university.

The first mention of education in a message of the Governor occurs in the messages of Governor Slaughter in 1816, and again in 1817, 1818, and 1819, but the legislature took no action on his recommendations. In December, 1821, the state made provision for the first aid for common schools by providing that one half of the net profits of the Bank of the Commonwealth were to be set apart to form a permanent Literary Fund, but the income, which eventually amounted to about $60,000 a year, was not spent for education, but was used by the legislature for defraying deficiences in the general state revenues. In 1821 the legislature was induced to appoint a commission to investigate the question of public education and to make a report on the subject. This the commission did in 1822, reporting in favor of fostering Transylvania University as a state institution, the retention of the academies as training schools for teachers, and the establishment of a general system of public education for all, as nearly free as possible. The report favored the New York plan, with state appropriations supplemented by local taxation. The document was an able one, but since the people were not ready for taxation for education, the legislature did nothing more than print the report.

Louisville had the best schools in the state at the time, and in 1829 these were made free schools by a city appropriation for support. The next year, however, the city reverted to tuition fees, which continued up to 1840, when the schools were once more made free city schools. Night schools were established in 1834, and a superintendent of schools was first appointed in 1839.

An act to establish "a uniform system of public schools" was passed in 1830. This gave county courts power to lay off the counties into school districts, and the people were to elect three trustees for each district. Taxes up to six and a quarter cents on the $100 and a poll tax of fifty cents might then be levied for schools. So small was the interest in education, and so great the unwillingness of the people to pay taxes for schools, that few schools were ever organized, and the law remained practically a dead letter. The distribution of the surplus revenue in 1837 seems to have awakened a new interest in education. By an act of 1838 $850,000 of this fund was set aside for education, and the foundation of a public school system was laid. By this law a state school fund was established; a state board of education and a state superintendent of common schools were created; and county school commissioners, district school trustees, and local taxation were provided for. At this time, half of the children of school age had never been to school, and one third of the adult population could not read or write. This law provided a definite form of organization, but it took fifteen years to overcome the indifference and the opposition of the legislature and the people sufficiently to get the law into operation in every county, and no marked progress was made until after the Civil War. In 1840 the state refused to pay the interest on the school fund, and in 1845 the state school bonds were destroyed by legislative act. In 1848 the debt to the school fund was recognized and capitalized in the form of a bond; and in 1849 a proposal to levy a state two cent tax for schools was submitted to a vote of the people and adopted. The new constitution of 1850, the first to mention education, contained a section which fixed the debt of the State to the school fund and declared it to be inviolate for the purpose of sustaining a system of common schools, and another section which provided for the election of a state superintendent of public instruction. In 1850 a law declaring the debt to the school fund a first charge on the resources of the treasury was carried in spite of the determined opposition of the Governor, and in 1853 some kind of a school was finally got into operation in each county of the state. The yearly income from all state sources was at this time but sixty cents per census child. By 1863 the income had risen to $1.10, but the losses of the Civil War caused it to fall to seventy-two cents by 1867. In 1855 the state school tax was raised from two cents to five cents by popular vote, and in 1856 an unsuccessful attempt to revive Transylvania University by converting it into a state normal school was made. The Civil War for a time seriously interrupted the work of education, and at its close the need of educating the negro was added to the educational problems of the State.

In 1867 agitation for a better organized and financed system of public education was begun by the new State Superintendent, Z. F. Smith. Two years later his proposals for an increase of the state school tax from five cents to twenty cents, with poll taxes and local taxation, were approved by the legislature and the people, and in 1870, a new school law was enacted which laid the basis of the present system. In 1873 district taxation was authorized to supplement the state funds. A system of colored schools was begun in 1866, when all taxes paid by the colored people were set apart for the benefit of colored schools, and in 1882 the apportionments for white and colored schools were equalized, and the state school tax raised from twenty cents to twenty-two cents. Since this time other additions have been voted, the present tax being twenty-six and a half cents. In 1884 county superintendents, elected by the people, were substituted for the county commissioners appointed by the county courts; the size of districts reduced; and provision made for state and county institutes.

In 1891 another new constitution was adopted, in which full and definite provision for a state system of public instruction was made for the first time, and the legislature was charged with the duty of providing "an efficient system of common schools throughout the state." The school fund was carefully defined; the direct-tax refund made by the national government, amounting to $606,641.03, was added to the permanent fund; separate schools for the two races were made mandatory; the income from the fund was required to be distributed without distinction as to race or color; and aid to sectarian schools was forbidden. The revised school law of 1893 carried these provisions into effect and provided, in addition, for the grading of all schools a five-months term, obligatory county teachers' associations, and county teachers' libraries. In 1896 a compulsory school law was enacted, which required eight weeks of continuous attendance each year from all children between seven and fourteen. In 1902 an act providing for county taxation and a county poll tax to extend school terms was enacted. In 1904 county school book commissioners to select a series of uniform textbooks for the schools of the state were provided for. In 1906 two state normal schools for white teachers were established. In 1908 a county school district law was enacted which provided for a partial abandonment of the school district plan and a partial approach to the county unit system. County high schools were also provided for. An educational commission was also created for the purpose of considering a revision and improvement of the school laws of the state.

Present Educational System. — At the head of the state school system is a Superintendent of Public Instruction, elected by the people for a four-year term and receiving an annual salary of $2500. He prepares all blanks and registers used; issues plans for school buildings; renders decisions on appeal; is general custodian of the school funds; must travel and visit the schools of the state; apportions the state school fund; makes plans for the teachers' institutes, and holds an annual conference with the institute conductors. He is also a member *ex officio* and chairman of the State Board of Education, the State Board of Examiners, and the Boards of Trustees of the three state normal schools, and a member *ex officio* and secretary of the State School Book Commission.

The State Board of Education is an *ex officio* body, consisting of the State Superintendent of Public Instruction, the Secretary of State, and the Attorney-General. It has charge of the school fund bonds, makes rules and regulations for the government of schools and the management of county teachers' libraries, and prescribes and publishes a graded course of study for use in the schools. The State Board of Education, together with the Governor, Auditor, Treasurer, and Clerk of the Court of Appeals, form the State School Book Commission, which adopts a series of textbooks for the schools of the state, acting on the recommendation of the different county school book commissions. The Superintendent of Public Instruction, together with two professional educators appointed by himself, constitute the State Board of Examiners. This body examines all county superintendents and all applicants for state diplomas and certificates, and prepares, subject to the approval of the State Board of Education, all questions used in the state and county examinations of teachers.

For each county a county superintendent of public instruction is elected by popular election for four-year terms. He must hold or secure a state certificate or diploma or a county superintendent's certificate. He must visit the schools of his county; superintend the taking of the annual school census and examine and report the results; decide all questions touching the administrative duty of teachers or trustees; pay all teachers on the certificates of the trustees; requisition the county judge for all textbooks needed to supply to indigents; and make an annual settlement with the county judge and an annual report to the State Superintendent. The county judge makes appointments, and may remove the superintendent for cause. With the county judge or the county attorney, he divides the county into districts and groups these into four, six, or eight subdivisions. Each district then elects one trustee and the different trustees unite to form subdivision boards of trustees, of each of which the county superintendent is *ex officio* a member, but without a vote except in case of a tie. The chairman of these subdivision boards of trustees, together with the county superintendent, form the county board of education for the county. This body grants all county teachers' certificates, and the county superintendent makes a report of all receipts and expenditures to it. It employs all teachers for the county high schools and fixes their salaries, and may prescribe a course of study for the same. It determines the amount of county school tax needed and lays the amount before the financial court of the county. It may establish new school districts, change boundaries, and consolidate districts. It holds the title to all school property, and may condemn or purchase sites and build and repair school buildings. County boards are required to establish at least one county high school in each county not having a four-years high school, or to unite with such a school already in existence, and to arrange for the free tuition of all high school pupils in the county. Three and two year high schools may also be provided, and all courses shall include domestic science, manual training, and elementary agriculture. The county superintendent, together with two persons appointed by him, constitute the county board of examiners. This body examines all candidates for county teachers' certificates, using uniform state questions, and reports the results to the county board of education. The county superintendent, together with the county judge and the county attorney, constitute a county school book commission, of which the county superintendent is chairman. This body meets, examines the books submitted to the State School Book Commission in response to its advertisement and reports its choice. A book to be adopted must receive a majority vote of the county school book commissions, except that after three trials, the books having the largest number of votes may be adopted.

The school district law is an attempt on the part of the state to do away with some of the evils of the district form of school government, and is an approach toward the county form of school government. The number of trustees for each school district has been reduced to one, holding office for two years, and he is a member of a subdivision board of trustees. Each trustee is required to supervise the school or schools of his subdistrict, compile an annual school census, and report in writing to his division board. The division boards elect the teachers for the different schools, and have general oversight of the schools. Graded school districts, levying a special school tax for graded schools, may be established by petition and affirmative vote of the people. Such districts may elect their own boards of trustees, who possess about the same powers as boards of trustees for county subdivisions, and who report to the county superintendent of schools. Cities similarly enjoy special privileges, and report to the State Superintendent direct. Graded school districts and cities receive their quota from the state school fund, but are exempt from the county school tax levied, if they levy a local tax of twenty cents for schools. The colored race may establish graded schools on the same terms as the white race; that is, each race pays for its own. Money and taxes for ungraded common schools are distributed without reference to race or color.

School Support. — The State was admitted before the policy of making land grants for education was begun by the national government and hence received no public land for schools. The permanent school fund of the state is largely nominal, being in the form of bonds of the commonwealth, the interest on which is raised, in part, by direct taxation. The state money is apportioned to the counties (for the districts) and cities on the basis of the number of census children, six to twenty years of age, though in making the apportionment, no subdistrict is considered as having less than fifty census children. A county school tax of not over twenty cents on the $100 and a county poll tax of $1 may also be levied by the fiscal courts of the county, on the recommendation of the county board of education, but all cities and special tax districts which levy a local tax of twenty cents are exempt from this so-called county tax. Any subdistrict may levy a local tax up to twenty-five cents, but very few do. Graded school districts, where established by either race, may levy a local tax up to fifty cents and a local poll tax up to $1.50. County high schools are maintained out of the county school tax.

Educational Conditions. — Of the total population about 87 per cent are white and 13 per cent are negroes. Only about 3 per cent of the population are of foreign birth. The state is largely rural and agricultural, 78.2 per cent of the total population living in rural districts, and about 18 per cent living in cities of over 8000 inhabitants. The illiteracy in the state in 1900 was very large, 16.5 per cent of the total population over ten years of age being illiterate. The percentage of illiterates among the whites was 12.8 per cent and among the colored people it was 40.1 per cent. This has been materially reduced since 1900.

In material conditions, the schools of the state, outside of the cities, make little better showing. Schoolhouses and school repairs are still provided largely by local subscription, though the number built by voting bonds has increased within recent years. As late as 1907 11.5 per cent of the schoolhouses of the state were log houses, and but 1.5 per cent were of brick or stone. Only 77 per cent of the schoolhouses are reported as being supplied with suitable desks and blackboards; 41 per cent as being supplied with globes, maps, and charts; while the average value of furniture and apparatus was but $57 per schoolhouse, and the average value of schoolhouses and grounds was $365 each. In the twenty-five cities of the state good school buildings are provided.

The school system of the state is as yet imperfectly organized, and the elementary school system is only imperfectly developed. The establishment of graded schools will help to round out the elementary school work, though these can be organized only in the more thickly populated districts, and few can be organized for the negro race under the present laws. In 1906–1907 there were 165 white and thirteen colored graded schools in the state. No statistics as to length of term of the county schools are available, other than that only 8 per cent of the schools are maintained for more than six months. No statistics are available to show the number of teachers who have had any form of professional training, but the number is not large.

Teachers and Training. — Up to 1906 the preparation of white teachers for the state was made in private institutions, but in that year two state normal schools for white teachers, the eastern and the western state normal schools, were established by the legislature, and both of these have done good work during the short time they have been in existence. For the education of colored teachers the state has for some time maintained the Kentucky Normal and Industrial Institute for colored persons, an institution offering normal, agricultural, mechanical, and domestic instruction.

Secondary and Higher Education. — Graded schools have been organized in many of the towns, but a high school system for the state is only now in the process of development. The new high school law of 1908 provides that the county boards of education, by 1910, must establish one or more county high schools in each county not having a first-class (four-year) high school, and directs the county boards to provide for the free tuition of all pupils completing the course of study in the elementary schools of the county. The law provides for the establishment of two, three, and four year high schools, and provides that domestic science, manual training, and elementary agriculture shall form a part of all high school courses of study. The funds for providing these schools are rather meager, as all county boards of education are allowed to levy a county school tax of only twenty cents on the $100 for all purposes, and out of this fund the high schools must be maintained. With the awakening of the state in all matters relating to education which is now under way, a good system of secondary schools may be expected to be developed before long.

In higher education the state helps to maintain the State College of Kentucky (*q.v.*), located at Lexington. This institution owes its origin to the Land Grants of 1862, the institution opening in 1866. In 1880 a state tax of one cent was imposed for the benefit of the college, and in 1904 an additional appropriation of $15,000 per annum was made. The institution is a combined agricultural and mechanical college and a school of science and arts. The state also maintains the Kentucky Normal Industrial Institute for Colored Persons, located at Frankfort; two normal schools for white teachers; the Kentucky Institute for Feeble-minded Children at Frankfort; the Kentucky School for the Deaf at Danville; and the Kentucky Institution for the Education of the Blind at Louisville. Ten colleges for men or for both sexes, and nine for women, mostly denominational, supplement the one state institution in providing collegiate instruction for the young people of the state.

E. P. C.

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KENTUCKY, STATE UNIVERSITY OF, LEXINGTON, KY. — A coeducational institution founded in 1865 as a Land Grant college as a constituent member of Kentucky, now Transylvania, University. In 1878 the agricultural and mechanical college was separated from the university and in 1880 was moved to Lexington. By an act of the General Assembly the style and title of the institution was changed to State University. At present provision is made for departments of agriculture, mechanic arts, and military science; an experiment station is maintained; and instruction is offered in sciences and classics. The entrance requirements are about fifteen units. The university embraces an academy, colleges of arts and science, agriculture, civil, mechanical, and electrical engineering, law, and a school of education. The college of law, to which after 1911 only candidates who can be admitted to the freshman year of college work will be admitted, gives a three-year course leading to the degree of LL.B. The School of Education courses are accepted by the state for teachers' certificates of different grades and duration. There were enrolled in 1909–1910, 721 students, of whom 427 were collegiate, 46 law, and 155 in the academy. The faculty consists of 65 members.

KENTUCKY WESLEYAN COLLEGE, WINCHESTER, KY. — A coeducational institution founded in 1863 and under the auspices of the Kentucky Conference, Methodist Episcopal Church, South. It provides preparatory and collegiate courses. The requirements for admission are fifteen points of high school work. Courses are offered leading to the A.B. and B.S. degrees. The A.M. degree is conferred after a year's work in residence and the presentation of a thesis. The faculty consists of nine professors.

KENYON COLLEGE, GAMBIER, OHIO. — Founded in 1824 as the theological seminary of the Protestant Episcopal Church in the diocese of Ohio. The present title was adopted in 1891. Candidates are admitted by certificate from high schools or by examination, the requirements being fifteen units. The college courses are divided into four groups, the classical course leading to the A.B. degree; the philosophical course leading to the Ph.B. degree; the scientific leading to the B.S. and the literary leading to the B.L. The faculty consists of twenty members.

KEPLER, JOHN (1571–1630). — One of the great astronomers, born at Weil in Württemberg. After attending various schools, he entered the University of Tübingen and studied classics and theology. He found an opportunity to study the Copernican system privately and devoted himself to the subject. In 1594 he was appointed to the chair of mathematics at Gratz, and had sufficient time to pursue his astronomical studies. In 1600 he became Tycho Brahe's laboratory assistant and in 1601 succeeded his master as imperial mathematician and astronomer. His first work which attracted attention was the *Mysterium Cosmographicum* (1596). In 1609 he published *Commentaries on the Motions of Mars*, the study of which had been assigned to him by Tycho Brahe. In this work he established two important rules: (1) of the elliptical movement of planets; (2) that the line joining the planet to the sun sweeps out equal areas in any two equal intervals of time. In 1612 Kepler became a teacher at Linz and continued his investigations. Between 1618 and 1621 he published: (1) *Epitome of the Copernican Astronomy*, in which his two previous laws are applied to other planets besides Mars; the distance from the earth to the sun is given with greater accuracy than by previous writers; the eclipses of the sun and moon are discussed and explained. (2) *Harmony of the World*, in which he formulated his third important rule that " The squares of the times of revolution of any two planets (including the earth) about the sun are proportional to the cubes of their mean distances from the sun." It was also in this book that he discussed the " music of the spheres," and gave a musical notation for each of the planets. (3) *Comets*, which included an account of the comet later known as Halley's Comet. In 1627 he published the *Rudolphine Tables* which were based on the observations made by Tycho Brahe and himself. While Kepler is ranked among the leading astronomers, much of what he wrote is of little value; of a mystical temperament, he often gave himself up to wild speculations, allegorical interpretations, and astrological explanations and predictions. On the whole, however, his method of work was scientific, for however fanciful his hypotheses may have been, he was untiring in correcting these by thorough observation and investigation.

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KERLIN, ISAAC N. (1834–1893). — Educator of feeble-minded and backward children. He was educated in the schools of New Jersey and the University of Pennsylvania, taking a medical degree in the latter institution in 1856. He engaged in teaching feeble-minded children, and from 1858 to 1892 he was superintendent of the Pennsylvania School for Feeble-minded Children. He was the author of a number of papers on the care and training of feeble-minded and idiotic children. W. S. M.

See Feeble-Mindedness.

KERSEY, JOHN (1616–1690?). — Teacher of, and writer on, mathematics. In 1650 he was teaching in Covent Garden London, and afterwards he removed to the Sign of the Globe in Chandos Street, St. Martin's Lane, London. In 1650 he published *Arithmetique Made Easie, or a Perfect Methode for the true knowledge and practice of Natural Arithmetique, according to the ancient vulgar way, without dependence upon any other Author for the grounds thereof. By Edm. Wingate, Esquire. The Second Edition, Enlarged* (*at the request and with the approbation of the Author with divers chapters*). . . . *By John Kersey, Teacher of the Mathematiques.* The late Professor Augustus de Morgan described Wingate as " one of the very best of the old writers on arithmetic." Kersey is also associated with Edward Cocker's *Decimal Arithmetic*, 1684. On the title page it is stated " Whereunto is added . . . also his Algebraical Arithmetic . . . according to the Method used by Mr. John Kersey in his Incomparable Treatise of Algebra." This had been published, the first volume in 1673 and the second in 1674, as *The Elements of the Mathematical Art, commonly called Algebra.* This work received the commendation of some of the best mathematicians, and became for some time the standard work. The Prospectus of John Kersey, which appears in the 1650 edition of Wingate's Arithmetic, shows the mathematical teaching in probably the best mathematical school of the times. F. W.

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KEUKA COLLEGE, KEUKA PARK, N.Y. — A coeducational institution chartered in 1892 as a member of the University of the State of New York. The first class was graduated in 1900. It is under the auspices of Free Baptists and Disciples of Christ. It maintains a preparatory institute, a college, and a department of music. The admission requirements are about fourteen units. The Regents College entrance diploma is accepted. The college offers courses leading at the end of four years to the A.B. and B.S. degrees. Of the enrollment of 107 students in 1910–1911, twenty-seven were in the college. The faculty consists of fifteen members.

KEY. — See Musical Terms.

KHAYYAM. — See Omar Khayyam.

KHOWARAZMI. — See Al-Khowarazmi.

KIDDLE, HENRY (1824–1891). — School superintendent and textbook author. He was principal of the first school established by the New York Public School Board (1841–1848). He was assistant superintendent of schools of New York City, under Samuel S. Randall (*q.v.*) from 1856 to 1870, and city superintendent of New York from 1870 to 1879. He was the author of textbooks in astronomy, physics, and grammar, of a series of school readers, and of several manuals for teachers, and was coeditor with Alexander Schem of a *Cyclopedia of Education.* W. S. M.

KIEL, THE ROYAL CHRISTIAN-ALBRECHT UNIVERSITY OF. — Founded by Duke Christian Albert of Holstein-Gottorp in 1665, the plans for its establishment dating back to the closing days of the Thirty Years' War, while the imperial decree had been secured as early as 1652 from Emperor Ferdinand III by Christian's father. The institution was opened under the most promising auspices; four faculties with a teaching staff of sixteen professors attracting no less than a hundred and forty students at the very beginning, a number which rose to almost nine hundred during the first decade of the university's life. After the death of the founder, the university was seriously impoverished as a result of the struggles which continued uninterruptedly between the house of Gottorp and the kingdom of Denmark. The history of the university at this time reads like that of an eighteenth-century American college, for we learn of an instructor who lectured on history, poetry, elocution, natural philosophy, politics, mathematics, and physics. But the attendance during the winter semester of 1762–1763 had shrunk to three students. Brighter days were in store for the university, however, for at this time the duchies of Schleswig and Holstein were reunited under Danish rule, and quiet was restored. In 1768 King Christian VII issued a mandate in accordance with which all residents of Schleswig-Holstein, who pursued university studies and looked forward to a career in their native land, were compelled to spend four semesters at the University of Kiel. Even under Danish rule the university continued to reflect German intellectual traditions and ideals, and politically, too, there was a strong sentiment among the faculty in favor of a reunion of the duchies with Germany. This pro-German attitude came to a head in 1848, when several of the professors sided with the duchy in its attempt to throw off the Danish yoke. As a result eight members of the faculty were dismissed after the disturbance had been quelled. After 1866 the university flourished under Prussian rule; in 1876 a new lecture hall was built, which was enlarged in 1902, while a library and a group of institutes and laboratories have been erected on the University hill. With these improvements in equipment, and with the growing importance of the city as a naval base, the attendance of the university has grown steadily of late and is still increasing, the summer enrollment being larger than the winter registration on account of the charming location of the city. The faculty of philosophy includes departments of agriculture and veterinary medicine, while the faculty of medicine makes provision for the study of dentistry and maintains, among others, a hygienic institute and a clinic for nervous and mental diseases. A student union, the Seeburg, situated on the shore of the bay, and, with the exception of the Palæstra Albertina at Königsberg, the only one of its kind in Germany, has recently been completed. The library contains almost 300,000 volumes and over 25,000 manuscripts. The annual budget of the university amounts to approximately $450,000. Among prominent former teachers of the university may be mentioned Von Jhering in law, Stromeyer and Cohnheim in medicine, Pfleiderer in philosophy, Dahlmann, Droyssen, Waitz, and Von Treitschke in history, Curtius, Müllenhoff, and Möbius in philology, Hertz in physics, and Eichler in botany. Klaus Groth, the famous Low-German (*Plattdeutsch*) author, was a docent at Kiel for several years.

The faculty is composed of 75 professors and 64 docents. In the winter semester of 1893–1894 Kiel ranked nineteenth in attendance among German universities, but by 1911–1912 it had advanced to the sixteenth position. In the latter year there were enrolled 1861 students, of whom 75 were auditors, the matriculated students being distributed as follows: Philosophy 708, medicine 506, law 320, theology (Protestant) 52. R. T., Jr.

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KIEV, UNIVERSITY OF. — See Russia, Education in.

KILDARE PLACE SOCIETY. — See Ireland, Education in.

KINÆSTHETIC SENSATIONS. — The sensations which arise from moving the members or from lifting weights and similar experiences are known as kinæsthetic. It has been shown that there are sense organs in the muscles and tendons and in the tissues about the joints, and it has also been shown that the sensations of movement and the others of this group disappear or are weakened whenever these sense organs are anæsthetized, or when the posterior roots of the cord through which their impulses are transferred to the brain are destroyed, as is the case in the disease known as tabes. It is demonstrated that the kinæsthetic sensations arise from the sense organs in muscle, tendons, and about the joints.

W. B. P.

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KINASTON or KYNASTON, SIR FRANCIS (1587–1642). — English scholar and poet, of a Shropshire family. He was at the University of Oxford 1601–1604, and also went to Trinity College, Cambridge, and took his M.A. there in 1609. He was called to the bar at Lincoln's Inn in 1611. In 1635 Kinaston published a Latin verse translation of two books of Chaucer's *Troilus and Cressida.* The object was to familiarize foreign as well as English readers with Chaucer's subject matter and is an excellent indication of the position of Latin at the period for such a purpose. Educationally, Kinaston is still more important on account of his project in 1635 to convert his own house in Bedford Street, Covent Garden, London, following Sir Thomas Gresham's (*q.v.*) example, into a college, which he agreed to furnish with books, manuscripts, musical and mathematical instruments, paintings, statues, etc., as well as charts, experiments, secrets, and demonstrations. He drew up *The Constitutions* of the college, which he termed the *Musaeum Minervae* (printed 1636). The normal course was to be for three years and a half, though it could be prolonged to seven years. It was to be confined to gentlemen. The object of the institution was to prepare the nobility and gentry with all necessary instruction (*e.g.* in languages) before undertaking foreign travel, which was then a part of educational equipment. The officers were: I. The Regent (in the first instance Kinaston himself), who was to "see performed" — Heraldry, Blazon of Coats and Arms, practical knowledge of Deeds and Evidences, Principles and Processes of Common Law, Knowledge of Antiquities, Coins, Medals, Husbandry, etc. II. The Doctor of Philosophy and Physic. III. The Professor of Astronomy who was to teach Astronomy, Optics, Navigation, and Cosmography. IV. The Professor of Geometry to teach Arithmetic, Analytical Algebra, Geometry, Fortification, and Architecture. V. The Professor of Music to teach skill in singing and music, to play upon Organ, Lute, Violl, etc. VI. The Professor of Languages for Hebrew, Greek, Latin, Italian, French, Spanish, High Dutch. VII. The Professor of Defence, to impart skill at all weapons and wrestling.

Other subjects to be taught in the *Museum* were Riding, Dancing and Behavior, Painting, Sculpture, Writing. Further, Kinaston intended to have attached a school for "the young gentlemen whose parents are desirous to have them brought up in the *Musaeum* from their first years." As much as possible all the subjects were to be treated "*by demonstration and experiment.*" Every year each professor was to give some rarity to the library from his own branch of learning.

It was provided in one of the regulations that opportunities should be taken by pointing to examples of the leaders in their own time and of their own ancestors to train the scholars of the institution to serve as "an example, help, reason, and happiness" to their inferiors. This project fell through on the death of Kinaston in 1642.

F. W.

See Academy, Courtly; Gentry and Nobles, Education of.

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KINDERGARTEN, THE. — An institution for furthering the systematic development of children below the school age by the organization of their natural play instincts in accordance with the principles upon which development is based. The name, which signifies a children's garden or garden of children, was selected by its founder, Friedrich Froebel (*q.v.*), because it expressed the idea which he wished to convey, of development directed by a knowledge of the organism to be developed, and aided by the selection of a right environment. There is another aspect of the kindergarten, however, — its social aspect, — of which this name gives no suggestion. From this standpoint it has been defined as "a society of children engaged in play and in various forms of self-expression, through which the child comes to learn something of the values and methods of social life without as yet being burdened by its technique." These widely differing definitions indicate the complexity of the institution.

The kindergarten was the product of Froebel's mature years, since he had been a teacher for nearly a quarter century before the idea of such an institution came to him. It is with the kindergarten that his name is chiefly associated, however, and upon it that his fame will ultimately rest. He himself considered the evolution of the kindergarten as the crowning achievement of his educational career, the supreme effort of his creative genius. This was due in part to the fact that he considered it the true foundation for effective school work and therefore the right beginning of all education; and in part to the fact that it embodies as in a nutshell the aims, means, and methods of education as he conceived it.

Evolution of the Kindergarten. — The doctrines which the kindergarten embodies were derived from many sources. While Froebel was still a student at the University of Jena, he came into contact with the idealistic philosophy of which that university was the center, and by later study he made its views his own. That philosophy interpreted the universe as an organic whole developing by means of a self-developing spiritual principle, and man as a part of that whole, whose end is to realize himself as one of its members by means of his own self-activity (*q.v.*). It interpreted the institution of society as expressions of man's spiritual nature, and held that that spiritual development of the individual could only be effected by participation in them. These views led Froebel to form certain important educational conclusions, — that education is in reality a process of development; that because man is spiritual and therefore creative, his development must be effected by means of creative self-activity; that since his spiritual development is achieved by participation in the organized life of his fellows education must be social, and that the best agency for his development during the early years is the child's own characteristic form of activity, play. All these doctrines Froebel had accepted and applied in his work with children of the customary school age for many years. The idea of an institution for young children in which play organized in accordance with these principles should be the sole educational agency did not occur to him until he was forced to consider the needs of a group of young children in an orphanage in Burgdorf, Switzerland, to the directorship of which he had been appointed in 1835. It was toward such an institution that his thought had been logically tending for some years, and it is not surprising that when the idea dawned upon him, he should have given several years to its elaboration.

In the institution which Froebel conceived he wished children to play with the freedom which they feel in the home, and the person in charge to organize and interpret their play experiences in the spirit of the mother but with an insight that the mother does not ordinarily possess. The carrying out of his idea, therefore, meant that the child gardener must be able to meet the children upon their own plane and lead them to a higher one by guiding their natural play impulses. Froebel saw, however, that, if play was to become an educational agency in this sense, it must be organized in several respects. The customary forms of play needed to be analyzed and classified with reference to the ends which each tends to accomplish in the child's development, and a progressive series of play instrumentalities needed to be devised by which that development could be effected. More important than even these was the determining from a careful study of children what the leading play interests are during the years for which such a form of education was intended, and how each may best be organized. In providing for the child's physical development by means of play, for example, his physical status during the years between four and six, and the nature and degree of development possible to him, must be determined before plays and games for the furthering of that development could be devised. A like study was needed before the plays and games that tend toward social coöperation or toward constructive or æsthetic effort could be created.

Although the knowledge required for such a study of children's play needs was inadequate at this period, Froebel undertook the organization of the play instrumentalities which his institution called for. These instrumentalities fall naturally into two groups, those in which no material is needed, and those in which the idea requires a medium for its expression. In the first belong the games of social coöperation and control. These are mainly of two kinds, — the dramatic games whose purpose is to represent the activities of groups of social workers, such as the farmer, the carpenter, and others, and the games of skill by means of which the qualities needed for successful social effort are cultivated. The instrumentalities which Froebel invented for the progressive development of the children's constructive and æsthetic power are the materials known as the "gifts and occupations." He had employed modeling, weaving, sewing, etc., with older children, and it was with the adaptation of these to young children that he now began. He saw, however, that although progressive exercises in each provided for continuity in separate lines, the relation between them, which he considered necessary, was lacking. He recognized the need, therefore, of a principle of connection, not alone to bind together the various forms of creative expression, but to furnish a basis for expression of any kind. This gave him the idea of an organized series of playthings from which children should gain a progressive series of sense impressions. This was the root idea of the kindergarten gifts.

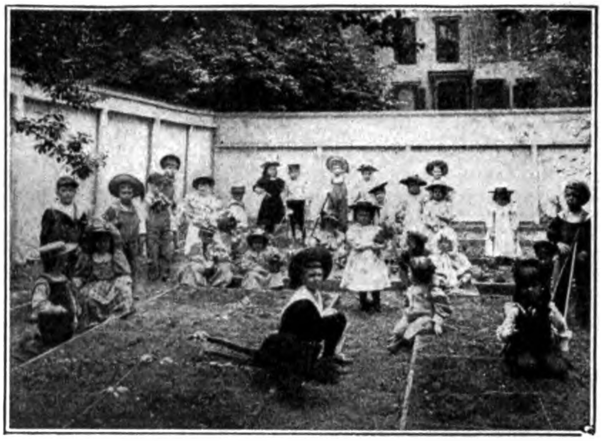
For the first of these he selected a set of balls of the six standard colors; for the second, the three fundamental forms; and for the several immediately following, cubes differently divided. From these he wished the children to gain, progressively, ideas of color, form, number, dimension, etc., and the ideas thus gained he intended them to work out creatively by means of plastic material. The gifts as an organized series, therefore, furnished the central principle which bound the several forms of play material into an organic whole. The organization of a system of instrumentalities which embodied the idea of progressive development that he wished to see effected in the child was therefore an important step in the evolution of the kindergarten itself. By the establishing of unity in the material for play, Froebel felt that he had made it possible to bring about the higher unity required in true educational effort, — that between the child and the means by which his development is to be effected. There are additional reasons, however, for Froebel's choice of the objects designated as gifts. According to the thought of the period, children have foregleams of great principles in the form of " anticipations " and " premonitions." These principles, it was believed, could be brought to their consciousness by play with the objects that symbolize them. The gifts are, therefore, not alone the means of conveying fundamental sense impressions, nor yet agencies for the exercise of creative self-activity; they are symbols of universal truths for children to absorb. By play with the first gift, Froebel believed that they would become conscious of the principle of unity; and by play with the second of the principle of mediation of opposites. So important did he consider this second principle that he not only embodied it in a gift, but made it the principle of method in the gifts and occupations alike. This feature of the gifts occasioned no little criticism when the kindergarten doctrines were brought to the test of modern thought, as will be seen later.

The Kindergarten in Practice. — With the organization of the materials for play completed, the institution which Froebel had conceived could come into existence. As has been stated, the conception of such an institution came to him in Burgdorf, Switzerland, in 1835. As an objective fact, it came into existence in Blankenburg, Germany, in 1837. It is because the name " kindergarten " was not adopted until 1840 that the latter year is given as the date when the first kindergarten was established. Blankenburg was a city of 2000 inhabitants, about two miles from Keilhau, the scene of Froebel's earlier labors. It afforded many opportunities for the gardening and nature excursions upon which Froebel laid great stress. A building adapted to the needs of the experiment was difficult to find, however, and the little company of children met in a disused powdermill. In spite of the unattractive surroundings, the new institution was at once successful. Froebel entered into a play with the children so completely, and the materials which he presented were so attractive, that the children were carried away with enthusiasm, and never realized that their play was being directed. The exercises were simple and informal, but similar in general character to those of the kindergartens at present. The children formed a circle upon entering and sang songs of greeting and thanksgiving. Then came a period of play with the organized materials in which the children's experiences were taken as a point of departure, and given meaning and relation by Froebel. After this the children marched to the gardens, the woods or fields, or the playground out of doors. In both the games and the nature observations, the children's immediate interests formed the starting point, and from these they were led naturally to games or observations controlled by those in charge. After the games or out-of-door period, came another period of play with the organized materials, and sometimes stories were told. From all accounts, Froebel indeed " lived with the children." One writer says of these first kindergartens: " Although the kindergarten system was then still in the making, its spirit was there in a freshness and wholeness that can hardly have been surpassed since."

The kindergarten has made great progress since Froebel's day, although the play program which he devised has not been materially altered. The doctrines which the kindergarten embodies are more clearly comprehended at the present; the agencies which it employs have been greatly improved; the program of exercises has been elaborated; and the kindergartners are better prepared to realize its ideals. A more fundamental knowledge of the child's nervous and muscular development has shown the need of a larger material and more active games than those which Froebel planned; a clearer insight into his modes of thought has created stories suited to his comprehension yet tending toward the formation of true literary tastes; and a better acquaintance with the facts of his musical development has brought into existence songs that are childlike in thought and musical feeling, but in harmony with the fundamental principles of musical art. The kindergarten song, picture, and story are recognized to-day as the best that the arts which they represent can furnish.

The program of exercises in the kindergarten has changed somewhat since Froebel's day, although not wholly for the better. There are but few kindergartens at present in which the out-of-door work receives the attention which Froebel gave it or which its importance merits. Many other phases of the kindergarten program have been elaborated. The opening period, originally devoted mainly to songs, now generally includes more or less organized conversation upon some phase of the children's experience. A period is frequently

The Original Kindergarten Circle at Blankenburg.

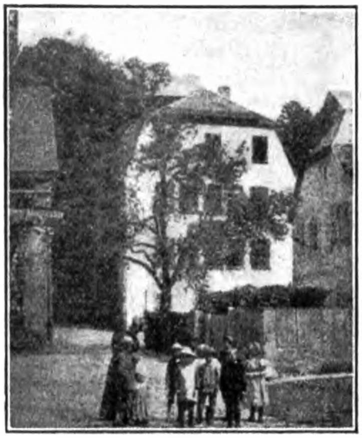


Gardening in an American Kindergarten.

A Public School Kindergarten at Work.

Kindergarten Circle in an American Public School.

The Pestalozzi-Froebel House at Berlin.



The Original Kindergarten House at Blankenburg.

KINDERGARTEN EDUCATION.

devoted to musical interpretation, voice work, or picture interpretation, but the games, and gifts, and occupation exercises still receive the greater share of attention. In many kindergartens the gift and occupation exercises overshadow everything else.

The work of the kindergarten has been much criticized of late as being too formal to be in accord with the principles of child development. The foundation idea of the kindergarten is that of development, and formal work is therefore out of harmony with its fundamental conception. There is but one phase of kindergarten procedure which has a tendency toward routine, — the work with the gifts and occupations. Froebel devised these as one of several means to the child's development, apparently of no greater significance than the games or the garden and nature work. As time passed, the balance between these several agencies became disturbed, some being neglected and others overemphasized. The out-of-door work has been almost eliminated, as has been stated. The work with the gifts and occupations, on the contrary, has received an inordinate emphasis, for reasons given later. But to select for emphasis the one among the several agencies that tends toward the formal and the mechanical is to give the work a direction that its founder could not have intended, since it is out of harmony with the fundamental idea which the kindergarten embodies. It is the undue emphasis that has been placed upon the kindergarten material that has caused the work of the kindergarten to become stereotyped and formal. It is against this feature of its work that the " liberal " movement, discussed elsewhere, is directed.

Status of the Kindergarten in Different Countries. — The progress which the kindergarten has made during the seventy or more years of its existence has surprised even its friends. It has found its way to every continent and its literature has been translated into the world's leading languages. It was introduced into almost every country in Europe during the twenty years following Froebel's death in 1852, by his most distinguished pupil, the Baroness von Bülow. In some of these countries the movement has made little or no progress, and efforts in its behalf are unorganized at the present time; in others the kindergarten is replacing the infant school (*q.v.*), which had been organized to meet the needs of the pre-school period before the kindergarten came into existence; and in others it has become an organic part of the school system. In the countries of northern Europe the existing kindergartens are mainly private or charitable. They have existed in Holland since 1857 as a result of the Baroness von Bülow's influence, and may now be found in all the large cities. Institutions for kindergarten training have been established in Leyden and Rotterdam. The state, however, does not concern itself with these. Denmark sent students to Dresden in the early seventies to be trained by the Baroness von Bülow, that they might introduce the kindergarten into their own country. As a result, the movement has had a steady growth, and kindergartens may be found in the larger cities. Copenhagen has as many as fifty, and a well-equipped training school. There are no kindergartens in Norway and very few in Sweden. In Finland, however, there are thirty or more, and a training school at Helsingfors. Russia sent students to Germany for training as early as 1861. There is a training school at St. Petersburg and some kindergartens in the large cities.

In Spain and Portugal, too, as well as in some of the countries of southeastern Europe, the kindergarten has but a slight foothold. A kindergarten was opened in Oporto in 1879, and at about the same time Spain sent several students to Dresden for training. Upon their return they established some kindergartens and a training college at Madrid. The king of Spain was trained by one of these kindergartners. In the early seventies several wealthy Greek women went to Dresden for training and upon their return established kindergartens in Greece. Kindergartens have also been opened in Bulgaria, Roumania, and Servia, but in all of these countries active effort in behalf of the kindergarten is slight. In many European countries the kindergarten has had a greater growth and has exerted a marked influence. In Germany, however, but little recognition has been given to it in spite of the effort of the Baroness von Bülow and other devoted friends of the cause. The centers of kindergarten influence in Germany have been Hamburg, in which Froebel's widow settled in 1854 to take up the work of kindergarten training; Dresden, which the Baroness von Bülow made the chief scene of her labors; and Berlin, in which city Froebel's niece and co-worker, Madame Schrader, built up the well-known Pestalozzi-Froebel Haus. As a result of these and other efforts the kindergarten is gaining strength in Germany, although it is not likely that it will be made a part of the system of public education. At the present time, kindergartens are to be found in all the large cities, supported in whole or in part by municipal grants. The *Bewahranstalten,* or caretaking institutions for children below the school age had gained favor in Germany before the kindergarten was conceived, and such institutions share with the kindergarten in public favor. In 1902 it was estimated that there were over 800 kindergartens and *Bewahranstalten,* in which 79,000 children were enrolled.

In Switzerland kindergartens have not been made a part of the school system, but their work is recognized as the true basis for that of the school, and the private institutions are rapidly being transferred to municipal authority. As early as 1876, 206 private *crèches* were converted into kindergartens under state control in Geneva, under the able leadership of Madame de Portugall. In 1906 there were forty-seven municipal kindergartens in Zürich, and seventy-three in Basel. There are also several well-equipped training colleges.

In Italy kindergartens are private and communal, although they receive grants from the general government. Kindergartens have been established in at least one fourth of the communes, Milan alone in 1908 having sixty-five under communal, and eleven under private, control. Since children are allowed to enter at the age of two and a half years, many of the so-called kindergartens are in reality *crèches*, or day nurseries, in which the educational features of the kindergarten are wanting. The lack of trained kindergartners is the weakness of the Italian kindergartens. There are some good training courses in connection with the normal schools, and excellent private training schools in Naples, Verona, and Rome. In the last named city is the Royal Froebel Institute, which received an endowment from Victor Emmanuel II. (See MONTESSORI METHOD.)

England and France are the principal European countries that have retained the infant school instead of adopting the kindergarten. But the Froebelian doctrines have had a marked influence upon the infant schools of England, and the movement in that country is of great interest. The first kindergartens were opened in London and Manchester in 1854, as a result of the Baroness von Bülow's effort. Many of the leaders are known to kindergartners the world over. They have directed their efforts, not to the establishing of kindergartners, but to the modification of the methods employed in the infant schools (*q.v.*). Official recognition of Froebelian principles was given in the Education Department's Circular (322) on the *Instruction of Infants* (1893). This necessitated the organization of courses of instruction for the teachers; the establishment of courses in the training colleges, and the inspection of the work done. In 1896 there were thirty or more institutions that gave kindergarten instruction, and ten kindergarten colleges proper. This has proved a task of some magnitude in view of the fact that in 1900 there were enrolled in the infant schools of England 622,494 children below the age of five years. Of the results, Mr. R. E. Hughes says in his *Making of Citizens*, "In the best English infant schools a profound revolution has taken place during recent years. Formal lessons in the Three R's have disappeared and the whole of the training of the little ones has been based on the principles of the kindergarten as enunciated by Froebel. Much of the old routine still remains; nevertheless there is no part of the English educational system so brimful of real promise as the work that is being done in the best Infant Schools." (See ENGLAND, EDUCATION IN; INFANT SCHOOLS.)

The Baroness von Bülow's efforts in France in 1855 resulted in many reforms in the infant schools of that country. Their reorganization upon a Froebelian basis continued for several years, but as the result of the feeling aroused by the Franco-Prussian war, everything German, even the name kindergarten, was rejected, and progress in that line came to an end. In 1906–1907 the *Écoles Maternelles* enrolled 651,955 children between the ages of two and six years. Their work is well organized and their equipment fair, but their educationl work leaves much to be desired. (See FRANCE, EDUCATION IN.)

If the real purpose of the kindergarten is to furnish the right beginning for the work of the school, that purpose is best realized in Belgium and Austria-Hungary, since these countries have adopted the kindergarten as a part of the school system. Belgium had a system of infant schools for children between the ages of three and six years, but in 1857 the Baroness von Bülow convinced the Belgian authorities of the wisdom of reorganizing these on a kindergarten basis, and the *Écoles Gardiennes* or *Jardins d'Enfants* are now in effect true kindergartens. In 1905 there were 2771 such institutions in the country, which were attended by 258,149 children, one half of those between the ages of three and six in the country. In completeness of equipment, in the preparation of its teachers, and in the quality of work done the *Jardins d'Enfants* of Belgium may well serve as a model for other countries.

In Austria-Hungary infant schools had been organized before the kindergarten was invented, but the influence of Froebel began to be felt even during his lifetime, and the transformation of the infant schools was gradually effected. In 1872 kindergartens were made a part of the school system. In 1903 there were 77,000 children between the ages of three and six years in the kindergartens of Austria, and 154,000 in those of Hungary. There is also a completely organized system of day nurseries, which enrolled 152,000 children. The kindergartens of Hungary are among the best in the world and may be classed with the best Swiss and American kindergartens. The equipment is admirable and the spirit and training of the teachers excellent. There are many good training schools.

The kindergarten has gained a foothold on other continents also. Those in Asia and Africa are in the main the result of missionary effort by the leading churches of the United States. In Buenguella, Portuguese West Africa, there are kindergartens in four out of five mission stations. There is another such kindergarten in Umtali, Rhodesia. There are a few kindergartens in other parts of Africa, — in Cisambia, Bailundu, Machakos, and Cape Town.

In Asia the kindergarten is in large measure the product of American missionary enterprise. In Asiatic Turkey there were in 1896 twenty-eight kindergartens, the outgrowth of a mission kindergarten opened in Smyrna in 1885. In India there are several kindergartens and training schools of missionary origin, — one at Lucknow, in connection with Thoburn College, and one at Sholapur. Kindergartens may also be found in Calcutta, Bombay, Cawnpore, Madras, and several other cities. There are several kindergartens in connection with missions in Burma, and at least two in China, one in Foochow, and one in Penang. In Foochow there is also a training school. In Japan the kindergarten is a conspicuous part of the missionary work. A kindergarten and training school were organized in Kobe College, one of the important centers for training of girls, in 1889, under the leadership of Miss Annie L. Howe. This has had a wonderful development. Several other training schools have been organized since that time.

In Japan, however, the kindergarten had been adopted before it became an agency in the missionary work of that country. When Japan reorganized its educational system upon a western basis in the early seventies, it sent to Germany for some one to introduce the kindergarten into its educational plan. As a consequence, a kindergarten was opened in connection with the Female Higher Normal School in Tokyo, in 1876, and the adoption of the kindergarten as a part of the public school system was provided for. In 1904 there were 185 public, and nearly a hundred private, schools. In these 24,000 children between the ages of three and six years were enrolled. In buildings, gardens, playgrounds, and in general equipment the kindergartens compare favorably with the best in America. Training work has not been adequately organized, however, and many kindergartners are not well trained. This is not surprising in view of the many difficulties to be overcome. The fact that Japan has already done so much is proof that she will do still more The fact that the leading country of the Orient has adopted the kindergarten will insure a like adoption by other Oriental countries in the near future. (See JAPAN, EDUCATION IN.)

In Australia the kindergarten has not gained as strong a foothold as one would expect. The school system is based upon that of England and the problem is therefore that of substituting the kindergarten for the infant school, or reorganizing the latter in accordance with the principles of Froebel. The centers of kindergarten work and influence are Sydney, Melbourne, and Adelaide. Sydney stands at the head of the movement in Australia. It has a fully equipped training college, with a staff of American trained teachers. The college has about fifty students. In this city the tendency is to substitute kindergartens for the infant schools, and there are therefore several public kindergartens, as well as private ones. The Educational Department of New South Wales has become convinced of the value of kindergartens, and is establishing them in the public schools of the province wherever possible. The work in Melbourne has also been of great value. Something along kindergarten lines was attempted in the infant schools of this city as early as 1887. In 1900 the reorganization work of the infant schools upon a kindergarten basis was begun and much has been accomplished in that direction. Reforms in this direction have also been introduced in Adelaide.

In South America the kindergarten has apparently made but little progress. Some kindergartens were organized in Buenos Aires and elsewhere in Argentine in the nineties, but the training of the kindergartners was apparently very inadequate, and in 1900 all these in Buenos Aires were closed by the Board of Public Education. Miss Sara C. Eccleston, who has given kindergarten instruction in the normal school at Buenos Aires for nearly twenty years, said with reference to this that "the imitations which were permitted to flourish for a time have been a great hindrance to the advance of the system." She adds, "As there are now several members on the board who have an idea of how a genuine kindergarten should be conducted, it is to be hoped that what seems to be a blow at the system is but a means to reëstablish the institutions under proper conditions." What the present status of the kindergarten in that country is could not be ascertained. In Uruguay the introduction of kindergartens was arranged for by the sending of students to Germany and Belgium for training by the government. The results of this effort made in 1890 could not be learned. In Chile some kindergartens have been opened, and some kindergarten instruction is given in the normal school at Santiago. In 1908 the government sent its leading kindergartner to the United States for observation. This will doubtless give the movement in that country an impetus toward kindergarten effort. In Brazil one or two kindergartens have been established as a result of missionary effort in the United States. In Mexico the kindergarten situation is not unlike that in the countries of South America. There are ten or more kindergartens in the City of Mexico, and a few in other parts of the country. Here, too, the training of kindergartners is very inadequate, since it is only such as can be obtained by the study of kindergarten books. The attempt is being made to improve this by improving and developing the kindergarten instruction in the Girls' Normal School of the City of Mexico.

In the United States the kindergarten has found a cordial reception and its doctrines have exerted a great influence. This country has a creditable number of kindergartens, but the success of the movement is not measured by that alone; it is measured as fully by its reorganization of the school, and the application of its principles to other fields. The first kindergarten in the United States was opened in Watertown, Wis., in 1855, by Mrs. Carl Schurz, a pupil of Froebel. During the next fifteen years ten or more German kindergartens were organized in German-speaking communities. The first kindergarten for English-speaking children was opened in Boston in 1860, by Elizabeth P. Peabody, who is usually considered the apostle of the kindergarten in the United States. In 1868 Madame Matilde Kriege and her daughter came from Germany to organize kindergarten training in Boston, and in 1872 Miss Marie Boelte, now Madame Kraus-Boelte, organized kindergarten training classes in New York City. The following year, her pupil, Miss Susan E. Blow, in coöperation with W. T. Harris (*q.v.*), opened the first public school kindergarten in St. Louis, Mo. The movement grew rapidly and St. Louis became one of the chief centers of kindergarten influence. At about the same time a kindergarten was opened in the German-English Academy of Milwaukee, Wis., and training courses were organized both in German and English by the president, W. N. Hailman, and his wife, Eudora L. Hailman. The first kindergarten in Chicago was opened in 1874 by Mrs. Alice H. Putman, and training work under her direction was inaugurated soon after. In 1880 four hundred kindergartens had been opened in thirty different states, and kindergarten training had been organized in ten of the leading cities. During the decade from 1880 to 1890 kindergarten associations were organized in all the important cities of the country for the promotion of the kindergarten cause. Many of these opened kindergartens in the poorer parts of their respective cities, and thus proved the value of the kindergarten to educational authorities. In consequence, kindergartens were increasingly incorporated into the school system. From 1890 on, the increase in public school kindergartens has been rapid. In 1903–1904 the *Report* of the Commissioner of Education showed that there were over 3000 public kindergartens, which were attended by nearly 200,000 children. The number of private kindergartens is supposed to be about 1500.

With the growth of the movement there has been a great increase in the number of kindergarten training schools. At first these were all private or were supported by kindergarten associations. There are at least a hundred of these at present. In addition, kindergarten training departments have been organized in more than seventy state normal schools, and nearly twenty colleges and universities. This growth has been made possible by the enactment of laws in twenty-seven states, legalizing the expenditure of public school funds for the education of children below the legal school age. In eight states the kindergarten may be established without legislation. The kindergarten therefore has a legal foothold in all but eleven states. It has also been adopted in Cuba, in Porto Rico, and the Philippines.

The kindergarten in the United States has been the stimulus to the adoption of the kindergarten in Canada. This was the direct result of a visit made to the kindergartens of St. Louis by Mr. J. L. Hughes of Toronto in 1882, at the request of the department of education of the Province of Ontario. The result was the adoption of the kindergarten as a part of the school system in that province, Miss Ada Marean, now Mrs. Ada Marean Hughes, being appointed supervisor of kindergartens in Toronto. Before the end of the decade the other cities of the province had adopted kindergartens, and training departments had been organized in the normal schools at Toronto, Ottawa, and London. In 1905 there were 130 kindergartens in the province, which were attended by 12,000 children.

In the province of Quebec there are public kindergartens in Montreal only. The movement in this city was inaugurated in 1892, and in 1905 there were sixteen public kindergartens in the city and suburbs. There is a kindergarten training department in the McGill normal school. In other Canadian provinces the kindergarten has found less foothold. In New Brunswick there have been private and mission kindergartens since 1880, but it was not until 1910 that public kindergartens, two in number, were opened in St. John. In Nova Scotia there are three public kindergartens, and a kindergarten training department in the normal school at Truro. In Winnipeg there are only private and charitable kindergartens. The need of kindergartens in the western provinces is conceded, however, and its extension to that field is but a matter of time.

Influence of the Kindergarten. — The recognition which the kindergarten has received the world over is proof that it possesses exceptional educational value. Its doctrines, based upon the conception of evolution before the theory had been worked out, are in fundamental accord with modern thought, and have in recent years received signal indorsement from the evolutionary sciences. As the world's thought has been reconstructed on the basis of these sciences, the value of the kindergarten has been increasingly recognized. The critical study which it has received during recent years has satisfied educational experts that the conception of education which it embodies is essentially the true one. In spreading that conception, and in indicating the reconstruction in general education which must follow its acceptance, the kindergarten has been a significant influence. By showing the vital interest that children take in doing, the kindergarten demonstrated at one stroke that activity, based upon the child's stage of development, forms the true basis for education. By revealing the child's delight in beauty, it indicated the value of art as an educational factor; and by illustrating the pleasure and profit that children derive from games and other forms of social coöperation it suggested a means for the child's social development that had not thus far been utilized for educational purposes. It demonstrated these truths for one period only, but from that demonstration their application to the rest could easily be inferred. The application of these truths to educational procedure beyond the kindergarten has as yet made little progress except in a few countries. Although kindergartens flourish in Germany its doctrines are wholly unrecognized in the work beyond the kindergarten. But in Belgium, Switzerland, Austria-Hungary, and Italy, these same doctrines have exerted a marked influence, not alone in transforming the infant schools, but in reconstructing that in the grades beyond. And although England has not adopted the kindergarten, a complete reorganization of the infant schools is in progress on the basis of its principles, and a reorganization of the work beyond as well. It is in the United States that the application of the kindergarten doctrines to the work beyond the kindergarten has made the greatest progress, and what follows applies mainly to that country. The fact that the elementary curriculum is being reconstructed in the United States on the basis of the child's developing powers at different periods; that subjects involving activity, such as art and manual training, are being accorded an important place there; and that games and other forms of coöperative effort are being incorporated into school life, — all these changes are due in no small degree to the influence and example of the kindergarten.

It is not alone in the reorganization of the curriculum upon a psychological basis, however, that the influence of the kindergarten is apparent; it is discernible also in a new conception of method. Upon the old basis little was asked of the child in the educational process except receptivity. According to the new, as illustrated in the kindergarten, the child must make his contribution of self-active effort before the teacher can furnish the interpretation and guidance which constitute her contribution. On this basis, educational method is a process of interaction between the child and the teacher, in which the child contributes the impulses and interests, and the teacher the organization of these toward their educational ends. The attitude toward children which this calls for is illustrated by the kindergartner, whom the children regard as a companion rather than as a teacher. Such a method calls for even more than sympathetic insight; it calls for a knowledge of the children's progressive development at different stages, and the means of furthering it that was not demanded of the teacher in the earlier day. That the spirit which this conception of method inplies has already permeated the school in large measure is apparent. The work in art, in manual training, in music, and in language shows that the teacher seeks to secure from the children original expression, upon which she may exercise her function of guidance, for the purpose of leading them to higher levels of insight and power.

The influence of the kindergarten is apparent in still another direction. The school is organized upon a monarchical principle. Its chief virtue is obedience to an external authority. The practice of that virtue does not, however, fit children for a self-governed life among their equals. The qualities needed for such a life are acquired unconsciously in the kindergarten by participation in coöperative play. That institution is based upon the principles of democracy. It has, in fact, been called " the republic of childhood." It seeks to form correct habits of social action in children, but to do even more, — to lead them upon the basis of their own social experiences to a comprehension of and a recognition for the need of social laws. As a result of an insight into this truth the school has recognized that the development of self-governing power in children may be made an organic part of its procedure, and that such development is quite as important an educational end as the teaching of the school arts. It is, therefore, progressively organizing its work upon a coöperative and self-governing basis, and is becoming, like the kindergarten, a miniature society in which the laws underlying social coördination and control are learned by practice.

These are a few of the more important lines in which the kindergarten has influenced general education. It is difficult to trace that influence, however, since the doctrines of Froebel have become interwoven with allied doctrines derived from other sources. Dr. Monroe says: " The Froebelian movement is characterized by an emphasis upon the importance of the child, upon his interests, experiences, and activities as the starting point and means of introduction, and by an improvement in the spirit, purpose, atmosphere, and morale of the schoolroom. Whenever the emphasis in school work is placed upon the activities of the child rather than upon the technique of the process of instruction, and whenever development of character and personality is sought rather than mere impartation of information and training of intellectual abilities, there the Froebelian influence may be recognized."

Modern Tendencies. — The effort to apply the doctrines of the kindergarten to general education had an effect upon the kindergarten itself that was hardly anticipated. Upon its adoption by the school the kindergarten was brought to the test of present-day knowledge of the child's development, — a knowledge far greater than that possessed by Froebel himself. That test revealed the fundamental truth which the kindergarten embodies, but it revealed also defects hitherto unrecognized — the result either of Froebel's inadequate knowledge of the facts of child development or of his interpretation of these facts in a manner not sanctioned by modern scholarship. The smallness of the kindergarten material and the lack of adequate activity in the games resulted from Froebel's inadequate knowledge; the symbolic basis in the gifts grew out of his belief that the children have anticipations of universal truths in advance of experience, and that they may become conscious of these by means of play with materials which symbolize them. This challenging of kindergarten theory and practice caused considerable hostile feeling among kindergartners who had thus far accepted the Froebelian doctrines without question, and considered the doctrine of symbolism as not only sound because sanctioned by rational psychology, but of especial importance. It was in fact regarded by many kindergartners as the keystone in the arch of kindergarten education and the justification for the exaltation of kindergarten instrumentalities. In time the differences between the theory and practice of those holding these different attitudes became more clearly defined and the terms "conservative" and "liberal" were adopted to designate them. The work of the two schools which have thus grown up shows considerable divergence. That of the conservative school follows quite closely the traditional lines, although it shows that the criticisms have not been without effect. In consequence the size and quality of the materials has improved in even the most conservative kindergartens; the games are better adapted to the children's physical needs, and the "occupations" are used with a better appreciation of the principles that underlie art education.

The theory and practice of the liberals has not been fully worked out as yet. They recognize the need for an interpretation of the universe such as philosophy gives as a basis for education, but they maintain that in the nature of the case no such interpretation can be final. Any interpretation implies an adequate basis of facts, and this the inductive science alone can furnish. Although the end of education must be found in the interpretation of the facts, they agree with the educational expert in believing that the method of education cannot be deduced from philosophy but must be found in the observed facts of child life, *i.e.* in the sciences. Basing their method upon genetic psychology, the liberals interpret education according to Froebel, as the progressive organization of the impulses that have educational significance, — the impulses to communicate, to dramatize, to represent, and to construct. They value the kindergarten instrumentalities chiefly because of their power to satisfy and thus to organize these various impulses, and consider that the Froebelian ideal of education has been realized when the children's responses to the stimuli of the materials have been guided to a higher plane than they could themselves reach. The liberals, therefore, use the kindergarten material "on a basis of selection and elimination rather than as a related whole whose value is lost if the charmed circle of unity be broken." Thus the whole tendency of the liberal movement is away from the formalism into which the work of the kindergarten has fallen and which has brought it into disfavor, and in the direction of that for which it was originally created, — the child's natural development. The movement has already had an appreciable effect in lessening the mechanical work against which criticism has been directed and in bringing back into the kindergarten the childlikeness that prevailed there in Froebel's own day. The liberal kindergartners believe that the reconstruction of kindergarten thought and practice, which they are attempting to effect, will not only make the kindergarten a more perfect instrument for its mission to the world's little children, but a more perfect one likewise for the dissemination of the doctrines which it embodies, — the doctrines of the new education. N. C. V.

See FROEBEL, FRIEDRICH; and articles on the various National Systems of Education; also INFANT SCHOOLS; INFANT EDUCATION.

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KINDERGARTEN AND THE ELEMENTARY SCHOOL. — See KINDERGARTEN.

KINDERGARTEN, HYGIENE OF THE. — The physical characteristics of the child of three to six are such that the primary aim of the kindergarten should be healthful development and protection from disease. Not only is the child at this period growing rapidly and its brain undeveloped, but its organism is poorly protected from contagious disease. The constituents of the blood are different in case of the child and in case of the adult. The number of white blood corpuscles in the blood, whose function is to destroy invading germs, *i.e.* the leucocytes with bactericidal power, according to some investigators, is much less. In other ways the child's protection seems to be inferior. Experiments upon animals have shown that young animals are likely to be more susceptible to contagion than mature animals, and the statistics of the ordinary children's diseases show that most of them occur in the early years of childhood. The mortality, also, is usually greater in the early years. It has been estimated that more than 90 per cent of the mortality from the ordinary children's diseases, scarlet fever, diphtheria, measles, and whooping cough, occurs before the age of ten. (See CONTAGIOUS DISEASES; MORTALITY AMONG SCHOOL CHILDREN.)

Most of these diseases not only occur more frequently, but are more fatal in the early years. Infantile paralysis is perhaps the only marked exception. In case of this disease it is said that, while children are more frequently attacked, it is more fatal to adults. Extended studies of measles have given emphatic evidence of the importance of protecting children at the kindergarten age. Studies in Munich and Graz indicate that the mortality among children between two to five years of age·is between 2.6 per cent and 5 per cent, while among children from five to ten years of age it is only from .1 to .4 per cent. In other words, if an epidemic of measles occurs in the kindergarten, out of a thousand cases forty children are likely to die, while, if it is possible to postpone the epidemic, even to the primary school age, there are likely to be only three or four fatal cases in a thousand. (See CONTAGIOUS DISEASES; and articles on separate diseases, *e.g.* COLDS; DIPHTHERIA, etc.)

Hence, the first duty of the kindergarten is to protect the children. It should never become the breeding-place for the school diseases. For this protection of the children the kindergartners must have an intelligent training in hygiene, and special records of the health condition of the kindergarten children should be kept. It should be possible for the teacher and the higher school officials to know at once from adequate records just how many unprotected children there are, or how much inflammable material is present in the class whenever a case of contagious disease occurs. Only in this way can rational and effective measures be adopted. If a case of measles, for example, occurs, and most of the children have not had the disease, the kindergarten should at once be closed. If, on the other hand, the majority of the children have already had the disease, the individual children that are unprotected can be excluded, but closure is unnecessary.

In regard to the schoolhouse for the kindergarten, there is a growing opinion that as far as possible the work should be out of doors, and only in inclement weather should the occupations be in the house. Whether in or out of doors, the ordinary rules of school hygiene should be observed. Care should be paid to the children's eyes; children with defective hearing should have special attention; and cleanliness should be everywhere enforced.

The kindergarten room should be large and well ventilated, the walls plain with simple hospital base without wainscoting, or the like, to catch the dust. The chairs should be arranged for occupation so that the light comes from the left and the rear of the children and none of the children face the sunlight. The blackboards should be low; and in the toilet rooms the bowls and sinks low, individual drinking cups used, or better a fountain of the improved modern type provided. Individual towels, or paper napkins, or the like, should be used; the clay should be disinfected every day, and all kindergarten apparatus disinfected at intervals. Especially to be condemned are dry sweeping, the use of feather dusters, the common towel, and common drinking cup. (See BLACKBOARDS; CLEANLINESS OF THE SCHOOLROOM; DESKS AND SEATS; DRINKING FOUNTAINS, etc.)

The air of the kindergarten room should not only be kept clean and be of the proper temperature, probably not more than 65° F., but it should be moistened by suitable devices, if nothing better offers, by a large shallow vessel of water on the stove or radiator. The extreme dryness of the air in many schoolrooms causes discomfort and many colds and sore throats. (See AIR OF THE SCHOOLROOM.)

As the kindergarten occupations consist largely of physical exercise and the use of the voice, the best modern methods of cleaning should be used, a vacuum cleaner if possible; if not, sweeping with oil preparations or the kerosene oil brush at night and wiping off the furniture and apparatus with a moist cloth in the morning. (See CLEANLINESS OF THE SCHOOLROOM.)

Finally, especial care should be given in the kindergarten to the hygiene of the nervous system. At this period, when the brain is in process of rapid growth and development, when much of the nervous substance is immature, it is important that there should be no undue stimulation either by too complex and too fine occupations, by overstimulating plays, or by unduly exciting stories, and the like.

The interest of kindergarten children can be easily kept by simple occupations; exciting stories and occupations are unnecessary and unwise, and likely to leave the children in a *blasé* condition, unfortunate from the point of pedagogy, as well as that of hygiene. It is maintained by Professor Tyler, President Hall, and some others, that the fundamental nerve centers controlling the large muscles of the different physiological series, and functioning the simpler and larger movements must be developed in the early years, if the normal development and the health of the nerves in later life are to be insured. These fundamental nerve centers form the line of defense for the whole body, and any premature development of the accessory centers, those functioning in the finer and more complex movements, is distinctly to be condemned for hygienic reasons. Thus, the activity in the kindergarten should be spontaneous motor activity, as far as possible the simple plays and games and simple occupations. All of the gifts and apparatus should be large; the occupations and exercises should involve the larger muscles; all fine delicate and complex processes are out of place. For example, the use of a hammer in driving a nail is a more healthful occupation for the kindergarten child than the threading of a needle; for the former involves the use of the large muscles of the hand and the arm, while the latter requires the delicate and complex coördination of the muscles of the eye and fingers. Some kindergartners seem to suppose that if in the finer occupations the work is held at a suitable distance from the eyes, that is all that is necessary; but a great part of the children probably at the kindergarten have hyperopic eyes, and their arms are not long enough, so that it is possible for them to hold the book or the work at the proper distance. The larger occupations are also necessary for their positive value.

The main business of the child at the kindergarten age is physical growth and spontaneous motor activity. Thus the primary aim of the kindergarten should be to protect the child from disease at all cost, to give opportunity for spontaneous normal development, and to develop habits of healthful activity both physical and mental. All scholastic acquisitions are of secondary importance and any formal scholastic training is out of place; and, if obedience be taught, other necessary social training will come spontaneously from association in group activities.

In recent years, improvements have been made in the kindergarten and there is a growing interest in all matters of health pertaining to the kindergarten child. The reforms especially needed at the present time are the following: (1) Clear and emphatic enunciation of health and normal development as the primary aim of the kindergarten. (2) The training of all kindergarten teachers in school and personal hygiene. (3) The adoption of modern methods of scientific cleanliness, which involve the abolition of common drinking cups, common towels, and the like. (4) The organization of the kindergarten out of doors for all occupations at all seasons of the year when the weather will permit. (5) Care of the nervous system by the avoidance of all forms of premature stimulation, fine and difficult work, and the like. (6) Competent health inspection with an adequate system of health records for each pupil and the adoption of modern methods in the management of contagious diseases. W. H. B.

See also Child Psychology; Child Study; Growth; Kindergarten.

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KINDERGARTEN MAGAZINE. — See Journalism, Educational.

KINDERGARTEN REVIEW. — See Journalism, Educational.

KINDERMANN, FERDINAND (1740–1801). — An Austrian educational reformer, born in Königswalde, near Schluckenau, in Bohemia. He studied theology at the University of Prague, where he received the doctor's degree in 1766. In 1771 he was called as pastor to the town of Kaplitz in southern Bohemia and there devoted his energies to the improvement of the rural schools. He introduced manual and industrial training, and his work attracted the attention of the Empress Maria Theresa, who was keenly alive to the educational needs of her subjects. She appointed him as general inspector of the German schools of Bohemia, and raised him to the nobility with the title "von Schulstein." In 1790 he was made Bishop of Leitmeritz, where he continued to work for the education of the people until his death. F. M.

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KING, CHARLES (1789–1867). — President of Columbia College, educated in England and France. He engaged in commercial and journalistic pursuits, but took an active interest in educational matters. From 1825 he was one of the trustees of Columbia College, and was president of the college from 1849 to 1864. Under his administration the school of medicine was reëstablished and the school of mines organized. W. S. M.

KING'S COLLEGE, LONDON, ENGLAND. — A constituent part of the University of London (*q.v.*), founded in 1829 "for the purpose of giving instruction in the various branches of literature and science and the doctrine and duties of Christianity as the same are inculcated by the United Church of England and Ireland." The Duke of Wellington was an ardent supporter of the college in its beginnings. Work was begun in 1831, and in 1836, when the University of London was founded, King's College became a constituent body. To the departments of literature and science a medical department was soon added; an engineering department followed in 1838; a hospital in 1839; theology in 1847; evening class in 1856; an oriental section in 1861; the woman's department in 1881. In 1903 the obligation of membership of the Church of England for appointment on the teaching staff was removed completely, except in the faculty of theology. By act of 1908 the departments of theology and advanced medicine were placed under independent boards and King's College and the King's College for Women were incorporated in the reconstituted University of London, with the following faculties and departments: arts, science (natural and medical preparatory); engineering; evening classes; and teachers' training department. The institution has always been well attended and the enrollment in 1910–1911 was 3147 (1402 regular and 1745 occasional students).

KING'S COLLEGE, THEOLOGICAL DEPARTMENT. — See LONDON, UNIVERSITY OF.

KING WILLIAM'S COLLEGE, I. O. M. — See COLLEGE, ENGLISH; GRAMMAR SCHOOLS; PUBLIC SCHOOLS.

KINGSBURY, JOHN (1801–1874). — Leader in the movement for the organization of high schools for girls; was born at Coventry, Conn., on May 26, 1801, and graduated from Brown University in 1826. He taught for two years in the schools of Providence, and in 1828 he organized the Providence Young Ladies' High School, which he conducted for many years. He was one of the founders of the American Institute of Instruction (*q.v.*) and of the Rhode Island Institute of Instruction, and from 1857 to 1859 he was State Superintendent of schools in Rhode Island. W. S. M.

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BARNARD, H. John Kingsbury and the Young Ladies' High School at Providence. *American Journal of Education*, 1858, Vol. V, pp. 9–34.

KINGSLEY, CHARLES (1819–1875). — The English clergyman, poet, and novelist was born at Holne, Dartmoor, and educated privately and at King's College, London. He entered Magdalene College, Cambridge, in 1838, was ordained in 1842, and in the same year he became curate of Eversley which practically became his home until his death. He was for a year, Professor of English Literature and Composition at Queen's College, Harley Street, London, under F. D. Maurice (*q.v.*), and in 1860 became Professor of Modern History at Cambridge. In his own parish he took a deep interest in the education of his people and established an adult school, a writing school for girls, and an infant school. He is, however, associated mainly with the Christian Socialist Movement, which he espoused in 1849, stirred by the sufferings of workingmen throughout the country. Under the name of "Parson Lot" he wrote "Letters to the Chartists" in *Politics for the People* and the *Christian Socialist*. *Cheap Clothes and Nasty* exposed the evils of the sweatshop, and the novels, *Yeast* and *Alton Locke* placed before a larger public the social questions of the day. His interest centered in "national education, sanitary and dwelling-house reform, the free sale of land and corresponding reform of the land laws, moral improvement of the family relations, public places of recreation." As a member of the Educational League he strongly advocated a national and comprehensive system of education and supported W. F. Forster's Bill (1870). In 1869 he delivered a presidential address on education, "female and male, compulsory and for all charges," before the Social Science Congress at Bristol, which was published and widely distributed. Like his friend, Maurice, he sympathized strongly with the movement for the higher and professional education of women. In *Health and Education*; a collection of various essays (1874) Kingsley dwells on the value of a knowledge of hygiene and sanitation and on the importance of science. *Alexandria and her Schools* (1854), is a collection of four lectures dealing with the rise, development, and decline of different systems of philosophy from the Ptolemaic era onward, and it was with one phase of this that the novelist dealt in *Hypatia* (1853). It is perhaps in the field of children's literature that Kingsley's contribution has been greatest and will be more enduring. His earliest work for children was *Glaucus or the Workers of the Shore* (1855), which like *Madam How and Lady Why* were intended to interest children in science. *Heroes or Greek Fairy Tales* (1856), *Water Babies* (1863), and *Hereward the Wake* (1866) are beautiful stories which will always continue to make their appeal to readers both young and old.

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KINNER, CYPRIAN. — A Silesian described by Samuel Hartlib as "of a very public spirit to advance that part of learning which is the foundation of all the rest, *i.e.* the right education of children." Kinner was born and educated in Silesia, and married a rich wife, from whose estate £2600 was set apart to develop his educational plans. But the imperial troops entering Silesia, he and his wife were driven into exile in Transylvania and Hungary, where he met Alsted. Kinner then came into communication with Comenius, and went to meet him in Prussia. Comenius was called away to Lessna, and Kinner was left at Dantzic "to depend upon Providence." He was anxious to devote himself entirely to educational plans, but had no funds even for subsistence. Samuel Hartlib translated the Latin draft of Kinner's educational tract, and published it in London *c.* 1648, under the title *A Continuation of Mr. John Amos Comenius's School Endeavours, or a Summary Delineation of Dr. Cyprian Kinner Silesian; his Thoughts concerning Education.* The title is interesting as anticipating that of John Locke. He aims at three "marks": Piety, Learning, and Civil Prudence. His main position for early teaching is realistic and is stated as follows: "I show Naturall Things in the living book of Nature; Things Artificiall in the Shops and Work-houses of their Makers, and both of them in the Repositories of their figures and representations, which belong to our School, where I show them either *living* or carved (yet as near the life as may be) or at least painted." Kinner is thus a follower of Lubinus (*q.v.*), as well as of Comenius, and appears to go even farther in the suggestion that "animals should be provided and kept for the purposes of school teaching." F. W.

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KIRCHENORDNUNGEN. — The laws or regulations for the government of the evangelical churches of Germany, issued by the rulers of various states, often with the advice and consent of the orders or estates. While there were *Kirchenordnungen* before the Reformation, the sixteenth century is the period in which most of them appear. Through these regulations the old laws were modified to meet Reformation ideals, and the maintenance of proper administration of teaching and sacraments was secured. Without some such laws an apparently impossible condition would have had to exist: the free development and administration of church and school laws upon the basis of the Lutheran ideal without the sanction of any responsible and efficient administrative body. While these *Ordnungen* were generally promulgated by the secular authority, they were largely the work of clergymen and teachers. Melanchthon, Luther, Bugenhagen, Joannes Aepin, Urbanus Rhegius, and many other prominent men of the time lent their assistance. Luther was the author of the Wittenberg *Kirchenordnung* of 1523 and collaborator in several others. Melanchthon was concerned in the writing of at least nine *Ordnungen,* beginning with Nuremberg (1526) and the Saxony Visitation Articles (1528). When once a few typical *Ordnungen* had been framed, they were adopted as models. Thus the Saxony Visitation Instructions became the basis of the Brunswick *Kirchenordnung* (1528); and upon the latter were based those of Hamburg (1529); Lübeck (1531), Pomerania (1535); Schleswig Holstein (1542), and many others, including that of Wittenberg (1533). This Wittenberg *Ordnung* in time became the model after which at least seven others were composed.

While the *Ordnungen* are not uniform in their material or arrangement, there is at least a general similarity in subject matter. As a rule there is a first part, called *Credenda,* which is dogmatic in its nature and is an expression, in more or less definite form, of the agreement of the city or provincial church with the general Lutheran confession of faith. This is followed by the *Agenda,* which contains provisions concerning liturgy, appointment of church officers, duties of officers of church and school, organization of church government, discipline, administration of church property, care of sick and poor, baptism, and miscellaneous matters relating to church affairs. C. L. R.

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KIRKLAND, JOHN THORNTON (1770–1840). — Fourteenth president of Harvard College and son of the famous educational missionary among the Six Nations of the American Indians, educated at Phillips Andover

Academy and Harvard College, graduating from the latter in 1789. He was instructor at Phillips Andover Academy and tutor at Harvard. He was president of Harvard from 1810 to 1828. His publications include numerous biographical and historical works. W. S. M.

See Harvard University.

KIRKLAND, SAMUEL (1741–1808). — Educational missionary among the Indian tribes of the Six Nations, educated in Dr. Wheelock's school for Indian youth (subsequently Dartmouth College) and at the College of New Jersey (now Princeton), from which he was graduated in 1765. For nearly forty years he was engaged in educational and religious work among the Indians of the Six Nations. He organized the Hamilton Oneida College (now Hamilton College) an institution for the education of Indian and American youth.
W. S. M.

KITCHEN GARDEN. — The Kitchen Garden is a method of teaching little children household processes through songs and games with an equipment designed for the purpose. This method was devised by Miss Emily Huntington (d. 1910), who directed a mission school for girls on the East Side of New York City more than thirty years ago. A visit to a kindergarten exhibition gave her the idea that children might be taught housework through games. She wrote the songs and games, which were afterward published in book form. She began by using toys as they were found in the market, and later found manufacturers who made articles designed for this purpose. Classes were formed in the Wilson Mission by a number of young women interested in the work of teaching these children. The Kitchen Garden Association was formed in 1880 to promote the teaching of industrial and domestic arts, enrolling eighty active members and supervising the instruction of nearly a thousand children in and near New York. Classes were formed in the West and South. The Kitchen Garden Association was reorganized as the Industrial Educational Association. (See Household Arts.) Miss Huntington also devised a series of lessons in cooking taught in the same way and published a volume of these lessons. The toys were copyrighted.

The Kitchen Garden system is still used in Settlement work in New York City to some extent, and for the same purpose in other parts of the country, but it has never become incorporated in the public school system. The work is being continued by Miss Peck of New York, whose method is now being used in Los Angeles, Washington, D.C., and New York.
H. K.

KLAUSENBURG (KOLOZSVÁR), THE ROYAL HUNGARIAN FRANCIS JOSEF, UNIVERSITY OF. — The youngest of the three Hungarian universities (the other two being Agram and Budapest), established in 1872. The university maintains faculties of law and political science, medicine, philosophy, and pure science, there being no school of divinity. The great majority of the students (1497 out of 2116 matriculated students in 1909–1910) are enrolled in the faculty of law, medicine following with 321, and philosophy and pure science bringing up the rear with 298; 191 auditors bring the total attendance of the year in question to 2307. The annual budget amounts approximately to $415,000. The library, founded in 1872, contains 200,000 volumes. Associated with the university is a Unitarian theological faculty, established in 1556, and a reformed theological academy, founded in 1895. Klausenburg is also the seat of an agricultural school, originally established in 1869 and reorganized in 1906. R. T., Jr.

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KNEIPE. — This term in the language of the German student may mean (1) the place where drinking takes place, or the tavern, (2) the drinking itself, or (3) by transference, a fraternity house. The *Kneipe*, before the introduction of fraternity houses, a recent movement, afforded the best meeting place for the members of one organization. In the derived meaning of the drinking ceremony the *Kneipe* is less formal than the *Kommers*. In connection with these ceremonies definite codes (*Biercomment*) have been established and are carried out under a presiding officer.

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KNIGHT, EDUCATION OF THE. — See Chivalric Education; Gentry and Nobles, Education of; Manners and Morals, Education in.

KNOWLEDGE. — A term of the very widest scope, designating, as will presently appear, a variety of operations and of subject matter that, however, possess at least two elements in common: namely, some connection direct or indirect with intelligence (or reflection) and with certainty, security, assurance, settledness. Like many analogous terms, — conception, judgment, thought, for example, — the term has both an active and a passive sense; it designates both an operation or act, that of knowing, and the result, what is known. Like the term "science," however, the word "knowledge" is itself used mainly in a passive sense to denote the content, the subject matter, which is the outcome of the successful performance of the function of knowing. The verb "to know" and the participle "knowing" retain both senses, designating the act of inquiry, search, finding out, and also the possession of a certain subject matter. The opposite of knowledge is ignorance.

The term " knowledge " covers four distinct connected matters. Of these the two first to be mentioned are the most personal, direct, and practical. They are knowledge in the sense of intelligently acquired skill, and in the sense of acquaintance. We know *how* to walk, talk, skate, etc.; experts know how to weave, dye, work metals, etc. Ability to do things is perhaps the most primary sense of knowledge. The ability is distinguished from instinct only in that it has been intelligently acquired. But even this difference is not consistently maintained, for we speak, popularly, of an instinctive knowledge. The first necessity of a living being is to know how to conduct itself with respect to certain situations; in order to live it must be able to adapt its behavior to the behavior of the things with which its own fortunes are bound up. This necessity includes not only physical needs, but also the fundamentals of social intercourse and the elements at least of some of the social arts. The primary and profound character of this sort of knowledge is seen in the fact that until the rise of philosophy among the Greeks the same word denoted art (technical skill) and knowledge, namely, τέχνη. The well-known recourse of Socrates to the analogies of the arts, his appeal to the procedure of the shoemaker, flute player, carpenter, etc., in his logical discussions was witness to the fact that the control of his material evinced by the artisan in reaching the ends appropriate to his art represented at once the most certain and the most intelligent procedure extant.

Familiarity, acquaintance, are closely connected with knowing how to do, and to a considerable extent they result from the latter and measure its extent. So far as we can adapt ourselves readily and successfully in any situation, we are familiar, acquainted. The rough edges of a strangeness, remoteness, the barriers of understanding nothing, are worn away. In their place there is a sense of intimacy, of inner adjustment. When we know how to behave with respect to a thing, we know what it is like; we are on terms with it; there is mutuality of response. Knowledge in the form of acquaintance is not only the outcome and reward of knowing how, or intelligent skill; but it establishes emotional ties — a capacity for appreciation, or apprehending the thing in terms of its worth, its usefulness for a purpose. Acquaintance, familiarity, normally presuppose a certain amount of friendliness, of agreeableness, as well as a sense of power and ease. But excessive familiarity, too long continued occupation with one subject, " breeds contempt "; it leads to revulsion, a sense of ennui and constraint.

Our third sense of knowledge covers that acquired from others, that attained indirectly by learning from others. Communication by means of language carries us far beyond the limits of personal acquaintance with persons and things, leading us to know *of* or *about* many matters which are within the direct acquaintance of other people. By oral tradition and more especially by written and printed language, this second-hand knowledge comes to include much that is not and that could not be within the direct acquaintance of any living. Such knowledge constitutes information (*q.v.*) and also learning — in the sense of what is learned or is to be learned.

In all the three above-mentioned types of knowledge, intelligence or reflective thought is used, but only secondarily. It is employed as a means of gaining control of things; in enlarging acquaintance with them; in apprehending and understanding things reported by others. It is not, however, used in any sense as a source of knowledge for its own sake. Gradually, however, materials of acquaintance and of information are amassed and systematized not for the sake of increasing familiarity and possession of learning, but for the sake of rational demonstration or of inferential discovery of new knowledge. Men are not contented with the kind of assurance that rests upon personal acquaintance or upon the credit of others; they search for that which opens from rational grounding, from logical sequence and system. Thus a fourth kind of knowledge comes into existence: rational knowledge, science, knowledge *that* so and so is true. Like information, this sort of knowledge is indirect, but it is indirect in the sense of dependence upon logical data and premises, not in the sense of dependence upon the observations and reports of others. From this point of view, knowledge is identical with *science*, and we have no logical right to denominate intelligent skill, matters of acquaintance, of information, *knowledge*, unless they are reduced to general principles and are connected with one another in systematic ways. Otherwise they represent beliefs, opinions, rather than knowledge. This tendency to define knowledge from an exclusively logical point of view has been an important factor in calling out in reaction the philosophy of pragmatism (*q.v.*), which regards this exclusive view of knowledge as the characteristic error of intellectualism (or rationalism, as it is sometimes termed). The purely technical character of knowledge when defined on a purely logical basis, its aloofness from practical considerations, from the affections and aversions (so important a factor in acquaintance) and from the social processes of learning and transmission characteristic of information, are treated as evidence that scientific knowledge, when isolated, is an abstraction. Thus the other types of knowledge are regarded as not only more primitive genetically and psychologically (which would be generally admitted), but also as more final and significant. In fact, knowledge as a system of logical propositions is regarded by it as ultimately of value because of the greater control and the greater richness of content that it supplies to the more direct, active, and social types of knowledge.

Educationally speaking, there can be little doubt that the order in which the four types of knowledge have been set forth in this article represents the order of their development. The opposition of all modern educational reforms to beginning with so-called "deductive" methods, with systems of definitions, classifications, and laws of explanation, is, in substance, a claim that the logical type of knowledge represents a matured, relatively late specialized development of more basic bodies of knowing, and is consequently meaningless and educatively harmful when presented in isolation or as a starting point. On the other hand, many of the reformers have, in their reaction against abstractions in education, failed to note the operation of a subordinated factor of reflection and interpretation in even the more primitive modes of knowing, and have thus made the mistake of identifying the "concrete" with the bare physical object, instead of with the center of an active experience, or interest.

Many questions of instruction are bound up also with the matter of the relation of information or communicated knowledge, to personal acquaintance. A flavor of the second-handed, derived, and more or less conventional hangs about information. Its subject matter is not so vitally lived through, so intimately appreciated, as that of familiar acquaintance. Any examination of prevailing modes of instruction will show that the mere bulk of matter communicated in books and lectures tends to swamp the native and active interests operative in intelligent behavior and in the acquaintanceship it brings. Then this matter remains unassimilated, unorganized, not really understood. It stands on a dead level, hostile to the selective arrangements characteristic of thinking; matter for memorizing, rather than for judgment; existing as verbal symbols to be mechanically manipulated, rather than as genuine realities, intelligently appreciated. Yet without this communicated matter, the circle of personal acquaintance is very narrow and superficial, and personal activity hardly gets above the place of routine. The solution is found in realizing that social communication is a very real factor in personal doing and acquaintance. The educational aim is not to multiply information for the sake of information, nor yet to try to exclude it or narrow it down as much as possible. It is to fuse the transmitted matter and the matter of direct behavior and emotional response with as intimate union as possible, so that the former will gain force, vivacity, directness from the latter, while the former is insensibly but continually extended and deepened by the latter. In short, the common error does not consist in attaching great importance to transmitted facts and ideas, but in presenting them in such an isolated way that they are not spontaneously welded with the intense, though narrow, matters of direct concern. J. D.

KNOWLEDGE, SOCIETY FOR THE DIFFUSION OF USEFUL. — See SOCIETY FOR THE DIFFUSION OF USEFUL KNOWLEDGE.

KNOWLEDGE, THEORY OF. — See EPISTEMOLOGY; KNOWLEDGE.

KNOX COLLEGE, GALESBURG, ILL. — A nonsectarian, coeducational institution, incorporated as Prairie College in 1836, had its inception in the plan of the Rev. George W. Gale, a Presbyterian clergyman, to found a college in the Middle West. In 1837 the institution was chartered as the Knox Manual Labor College. The name was changed to Knox College in 1857. The Lincoln-Douglas debate of 1858 was held on the grounds of the college. Distinguished presidents have been Jonathan Blanchard (1845–1856) and Newton Bateman (1876–1893), educational leaders in Illinois, and John Huston Finley, '87, who in 1903 became president of the College of the City of New York (*q.v.*). Knox College is one of the institutions originally accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*). The Board of Trustees is a body of twenty-five members selected by a committee of the trustees on whose recommendation the board acts; the term of service is for life. By resolution of the board no denomination can have a majority of trustees.

Knox College maintains undergraduate courses leading to the A.B. and B.S. degrees. The entrance requirements are fourteen units. A conservatory of music was organized in 1883. The degrees of A.M. and M.S. are given for one year's graduate study in residence.

There was in 1910–1911 a faculty of twenty-five members and an enrollment of 616 students, of whom 335 were in the collegiate department. C. G.

KNOX, JOHN (1505–1572). — The great leader of the Scottish Reformation, and deviser of the *Book of Discipline.* The date of his birth is uncertain, for though the traditional date is 1505, yet there are implications from contemporaries that seem to point to the limits of 1513–1515. Knox is thought to have been born in Giffordgate, a hamlet adjacent to Haddington in Scotland. It is assumed that he was educated at Haddington Grammar School, and entered St. Andrews University in 1529, where he studied the ancient fathers, particularly St. Augustine (*q.v.*), a fact which explains his "preparedness" for the doctrines of Calvin (*q.v.*) later on. By 1540 he had become a priest of the Church of Rome, exercised the office of notary, and for a time was a private tutor. It was not till 1545 that he showed any signs of becoming a Protestant. Knox came to England, and was sent by the Privy Council as Protestant Minister to Berwick-on-Tweed, where he stayed for two years, with a congregation consisting of the garrison and citizens. In 1551 he was removed to Newcastle-on-Tyne, and was appointed a royal chaplain, and had the offer of the bishopric of Rochester, which he declined. In 1554, when Queen Mary had already begun her policy of persecution, Knox left England, and after a tour through Swiss Protestant congregations, he reached Geneva and entered into friendship with John Calvin. From 1554 to 1559 Knox remained on the Continent. He became one of the two ministers of the English Protestant refugees at Frankfort in November, 1554. Here internal dissensions took place with regard to the use of the English Prayer Book, and Knox voluntarily retired to Geneva in 1555. The complete supremacy of Calvin in Church and State made a most imposing object lesson in theocratical government, one not lost on Knox, whose *Book of Discipline* was afterwards closely framed on the Genevan model. His theological views were definitized by his treatise on *Predestination* published in 1560. Knox's permanent return to Scotland was in 1559. He was appointed minister at St. Giles' Church, Edinburgh, and soon became the leader of the Scottish Reformation. In 1560 the Estates demanded a statement of the views of those who opposed Roman Catholic doctrine, and to Knox and five others was intrusted the drawing up of the *Confession of Faith.* Penal statutes were then granted against the saying of mass. In 1560 the organization of the Reformed Church was laid down in the *Book of Discipline,* which was drawn up by Knox and the other five ministers who had composed the *Confession of Faith,* and was translated into Latin, so as to obtain the criticism of Calvin and the Swiss Reformers. Knox brought Geneva and Calvin to Scotland and acclimatized them to Scotch soil. The Ecclesiastical polity carried with it, as was the case at Geneva, the educational system, and this, again, was of the most democratic type.

The chapter in the *Book of Discipline* devoted to schools could not be carried out without a large sum of money, and though the Scottish reformers proposed to appropriate the money for this purpose from the old ecclesiastical revenues, the Scottish nobles, as had been the case with the English nobles, hoped to get a share in the plunder. Their success necessarily deferred the carrying out of such a scheme into immediate execution. The *Book of Discipline,* however, did not receive the sanction of the Scottish Parliament, and Scottish education was not endowed with Roman spoils. Nevertheless, the educational ideals of the *Book of Discipline* mark an important stage in the history of education, for they suggest a deliberate scheme of organization of national education. The salient educational features of the *Book of Discipline* together with the steps in the actual development of the Scotch educational system are presented in the article on SCOTLAND, EDUCATION IN.

The later years of Knox's life (1560–1572) were concerned with the political and religious questions centering round the names of Mary, Queen of Scots, and (afterwards) of the regent, the Earl of Moray. Politically, in the days of the Tudors, he was prepared to advocate the deposition of tyrants, and thus is a predecessor of the spirit of a Cromwell. Religiously, Knox put Scotland in touch with the religion of Geneva, of the Huguenots, and the Dutch, and thus tended to help forward cosmopolitan sympathies, at least, amongst Protestants in Great Britain and abroad. His democratic tendencies are shown in laying the basis of Scotch Presbyterianism, in the introduction of lay elders and deacons into church government. It is not too much to say that these characteristics, though not technically educational, have had great educational effects.

F. W.

See CALVINISTS AND EDUCATION; SCOTLAND, EDUCATION IN.

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KNOX, SAMUEL (1756–1832). — A pioneer of education in Maryland, educated at the University of Glasgow. He was engaged for some years in the ministry of the Presbyterian church. In 1795 he became principal of the Frederick Academy. Subsequently he organized and became the president of Baltimore College. He was active in the attempts to organize a common school system in Maryland and published numerous pamphlets on the subject. Thomas Jefferson (*q.v.*) was keenly impressed with his educational views. Knox's most valuable contribution to the literature of education is his *Essay on the best System of liberal Education adapted to the Genius of the United States* (Baltimore, 1799). W. S. M.

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KNOX, VICESIMUS (1752–1821). — English schoolmaster and essayist, born near

London. He was educated at Merchant Taylors' School and St. John's College, Oxford, graduating B.A. in 1775 and obtaining a fellowship. In 1778 he succeeded his father as headmaster of Tonbridge School, a position held up to 1812. He devoted himself to miscellaneous essay writing, *Winter Evenings or Lucubrations on Life and Letters, Essays Moral and Literary, Family Lectures or Domestic Divinity* and several other works of a religious nature. For his school he edited Catullus, Horace, and Juvenal, and *Elegant Extracts, or Useful and Entertaining Passages in Prose, selected for the Improvement of Classical and Other Scholars in the Art of Speaking, in Reading, Thinking, Composing, and in the Conduct of Life* (1785); *Elegant Extracts or Useful and Entertaining Pieces of Poetry selected for the Improvement of Youth* (1789); *Elegant Epistles or a Copious Collection of Familiar and Amusing Letters selected for the Improvement of Young Persons and for General Entertainment* (1790). His treatise, entitled *Liberal Education or a Practical Treatise on the Methods of acquiring Useful and Polite Learning* in two volumes (1781), is a valuable contribution to the history of education. It not only contains sound criticisms of existing practice with suggestions for reform, but a good account of the best textbooks of the period. While insisting on thorough classical curriculum as the only means of educating gentlemen, Knox would admit such studies as English, French, geography, history, and the elements of Euclid. The modern languages are to be taught on the same method as the classics, that is, grammatically, although he recommends broad reading in English literature both in and out of school. Accomplishments and athletics are advocated, provided that they do not become distracting. Examinations are to be held frequently as a method of retaining what has been learned. Knox recognizes that women are intellectually as capable as men and would have them educated privately (for boys the public schools were best) in English and French, the classics being added, if they have inclination and wealth. The second volume deals with the universities and gives a very good insight into the corruption and lack of discipline there prevailing. Knox attacks conservatism, formality in trifles, absence of study, and idleness of the professors and fellows, who regard the universities not as places of education but as almshouses. The remedy according to Knox is greater emphasis on study and less on formalities supervised by the proctors. In 1821 Knox wrote *Remarks on the Tendency of Certain Clauses in a Bill now Pending in Parliament to degrade Grammar Schools, with Cursory Strictures on the National Importance of preserving Inviolate the Classical Discipline prescribed by the Founders.* The pamphlet was called forth by a Bill to introduce into the old foundations instruction in reading, writing, and arithmetic for poor children.

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KNOXVILLE COLLEGE, KNOXVILLE, TENN. — A coeducational institution for the education of negro youth under the auspices of the United Presbyterian church opened in 1875. The following departments are maintained: collegiate, normal, theological, musical, industrial, and common school. The entrance requirements to the college, which offers courses leading to degrees, are about fourteen points of high school work. Of the 404 students enrolled in 1909–1910, only 29 were in the collegiate department. There is a faculty of thirty-four members.

KÖBEL, JAKOB (1470–1533). — One of the most prominent of the early German writers on arithmetic. His name also appears as Kobel, Kobelius, and Kobilinus. He was born at Heidelberg in 1470, and died at Oppenheim, January 31, 1533. He was a fellow student of Copernicus at Cracow. He was a man of varied attainments, meeting with success as a *Rechenmeister*, printer, engraver, woodcarver, poet, and public official. He wrote three works on arithmetic that met with great favor: (1) *Ain New geordnet Rechenbiechlin*, Augsburg, 1514; (2) *Mit der Kryde od' Schriebfedern*, Oppenheim, 1520; (3) *Vysierbuch*, Oppenheim, about 1515. The third related to gauging, at that time a very popular subject. The first of these books was purely commercial, and the operations on numbers were performed by means of counters, as was then the custom. Roman numerals are used practically throughout the work, even in writing common fractions, where $\frac{\text{II}^{c}}{\text{IIII}^{c}.\ \text{LX}}$ appears for $\frac{200}{460}$. His work showed little Italian influence, and it is one of our best sources of information as to the early German arithmetic. D. E. S.

KOHLMANN, ANTHONY (1771–1838). — Jesuit educator, received his training in the schools of Germany. He became superior of the Order of Jesuits in the United States in 1817. He was rector of Georgetown College from 1818 to 1820 and superior of Washington Seminary from 1821 to 1824. He published a number of philosophical and theological works. W. S. M.

KÖNIGSBERG, THE ROYAL PRUSSIAN ALBERTUS UNIVERSITY OF. — Founded by Margrave Albrecht, the last knight of the Teutonic Order in Prussia, who in 1541 established a university preparatory school, transformed into a university, of Protestant affiliations, three years later.

The new university secured a good start, notwithstanding financial difficulties, enrolling a considerable number of foreigners, principally from Poland, Russia, and Sweden. Its further development was sadly hampered, however, by the plague of 1549 and still more by the Thirty Years' War in the following century. For two centuries after its establishment its history is replete with theological controversies. The close of the seventeenth and the beginning of the eighteenth century marked an era of healthy growth, for which the Great Elector and the first kings of Prussia were largely responsible. The period of its greatest renown, however, came somewhat later in the days of Kant (*q.v.*), who became a docent at the university in 1755, and full professor of philosophy fifteen years later (1770–1797). One of his successors was J. F. Herbart (*q.v.*), who established a pedagogical seminar at Königsberg in 1810.

In 1862 a new main building was erected for the university, and for thirty years after the Franco-German War considerable activity was displayed in the building of laboratories and institutes of various kinds, including laboratories for agricultural chemistry and for dairying, and in 1901 a new library building containing almost 300,000 volumes and about 1500 manuscripts.

Among the prominent former members of the teaching staff may be mentioned Bessel in astronomy, Jacobi in mathematics, Hagen in natural science, Burdach in anatomy, Helmholtz in physiology, physics, and mathematics, Wagner in surgery, Karl Lachmann in Germanic philology, and Simson and Stobbe in jurisprudence. The German Crown Prince is rector of the university, a prorector being elected annually by the faculty. The annual budget amounts to about $400,000. Through the initiative and financial assistance of Dr. Fritz Lange, a German physician who practiced for a number of years in New York City, the first German student "Union," the Palæstra Albertina, was established by the university in 1898. The building contains a gymnasium and a refectory, clubrooms, fencing rooms, swimming pool, etc.; but owing to the lack of sufficient endowment, provision has been made in it since 1905 for several university seminars.

In size Königsberg ranks fifteenth among the twenty-one German universities. In the winter semester of 1911–1912 there were in attendance 1694 students, of whom 199 were auditors. By faculties the matriculated students were distributed as follows: philosophy 701, medicine 432, law 280, theology (Protestant) 92. The teaching staff consisted of 91 professors and 57 docents.

The city of Königsberg is also the site of a royal academy of art, established in 1845 and reorganized in 1901.

The municipal library was founded in 1540 and contains 50,000 volumes and over 600 manuscripts.

R. T., Jr.

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KOREA. — See Japan, Education in.

KRAKAU, THE UNIVERSITY OF, KRAKAU, AUSTRIA. — One of the oldest universities in Europe, the papal bull providing for its establishment having been signed by Pope Urban V on May 12, 1364. No provision was made in the deed of foundation for a theological faculty, and six years after its foundation the university was compelled to close its doors. Permission to establish a faculty of theology was granted by Pope Boniface IX in 1397, and three years later the university was reorganized by King Wladislaw Jagello of Poland, being removed to a new site in the following year. Krakau being the capital of Poland from 1320 to 1610, the university served for several centuries as the center of the intellectual life of the Kingdom of Poland. Gradually, however, after the Polish capital had been transferred to Warsaw at the beginning of the seventeenth century, a decline set in and led finally to another reorganization in 1817. In the meantime, at the last partition of Poland in 1795, Krakau had been turned over to Austria, becoming part of the free state of that name thirty years later. In 1846 Austria again assumed control, and since then the development of the university has been marked by continuous progress. The German language was used in all faculties, with the exception of the theological, from 1853 on, but has been gradually supplanted by Polish, which has reigned supreme since 1870.

The university library was founded in 1400 and contains over 400,000 volumes, over 6000 manuscripts, over 3000 maps, and almost 10,000 engravings and other reproductions. It is housed in the old university building, which was completed in 1497, but altered and repaired at various times between 1839 and 1872. The new main building was erected in 1881–1887. The annual budget of the university amounts to approximately $225,000. Krakau is the third largest university in Austria, being exceeded in point of attendance only by Vienna and Budapest. In the winter semester of 1909–1910, there were enrolled 3211 students, including 441 auditors, of whom 209 were women. Of the matriculated students, 1307 men were registered in the faculty of law, 446 men and 48 women in the faculty of medicine, 701 men and 182 women in philosophy, and 86 men in theology (Catholic).

Krakau is also the seat of an art academy, established as an art school in 1818 and transformed into an academy in 1900. Here, also, Polish is the language of instruction.

R. T., Jr.

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KRAUS, JOHN (1815–1896). — Active in American kindergarten work. He was educated in the normal schools of Germany, and after coming to America was engaged in private and public school work, and from 1867 to 1873 he was connected with the Bureau of Education of the United States. In 1873, with his wife (Maria Kraus-Boelte), he organized a training school for kindergartners in New York City. His published writing includes several papers on the kindergarten. W. S. M.

KRÜSI, HERMANN, JR. (1817–1903). — American Pestalozzian, born at Yverdon, Switzerland, on June 24, 1817. He received his education in the cantonal schools at Trogen, the normal school at Gais (conducted by his father), and at the normal school at Dresden, conducted by Dr. Blochmann, afterwards minister of public instruction of Saxony, and at one time an associate of Pestalozzi in the institute at Yverdon. After an additional year of inspection of the normal schools and other institutions of Germany, he returned to Switzerland and taught for five years in the cantonal normal school at Gais under the principalship of his father (1841–1846). In 1846 he received an appointment as instructor in a Pestalozzian school at Cheam, England, organized by Charles Mayo (*q.v.*). The school was Pestalozzian in name only, notes Krüsi, for its methods were relics of the medieval age. At the end of the year he severed his connection with the school at Cheam to accept an appointment in the normal college conducted by the Home and Colonial School Society (*q.v.*). He had charge of the classes in methods of teaching, mathematics, and drawing, and while here he worked out and published his system of inductive drawing. After five years (1847–1852) in the normal college in London, he returned to Switzerland; but a year later he came to America to accept a post in the private normal school conducted by William Russell (*q.v.*) at Lancaster, Mass. Here his associate teachers were Dana Pond Colburn and Sanborn Tenney. He was institute lecturer in Massachusetts for two years (1855–1857), having as associates his countrymen Louis Agassiz and Arnold Guyot (*qq.v.*). For two years he was associated with W. F. Phelps (*q.v.*) in the newly organized state normal school at Trenton, N.J. (1857–1859). The next three years were devoted to lecture work in Massachusetts; and in 1862 Mr. Krüsi accepted an appointment in the state normal school at Oswego, New York, with Dr. E. A. Sheldon (*q.v.*), where he spent twenty-five active years in the work of training teachers. He was one of the principal figures in the Oswego movement (*q.v.*) which emphasized oral methods of instruction in primary schools. He resigned his post at Oswego in 1887 and spent his closing years at Alameda, California, where he died on Jan. 28, 1903. His published writings include a *System of Inductive Drawing,* published originally in England and republished in the United States, *Life, Work, and Influence of Pestalozzi, Recollections of my Life,* and various essays and addresses on the philosophy and history of education.

W. S. M.

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Krüsi, Hermann, Jr. *Recollections of my Life: an Autobiographical Sketch supplemented by Extracts from his personal Records and a Review of his Literary Productions, together with selected Essays,* arranged and edited by Elizabeth Sheldon Alling. (New York, 1907.)

Monroe, Will S. *History of the Pestalozzian Movement in the United States.* (Syracuse, 1907.)

KRÜSI, HERMANN, SR. (1775–1844). — Swiss educator and first associate of Pestalozzi, educated in the schools of Gais in the canton of Appenzell. He taught in the public schools of Appenzell from 1793 to 1799, when he took charge of an orphan school at Burgdorf. It was here that he made the acquaintance of Pestalozzi. After a short time Krüsi united his school with that of Pestalozzi, and he accepted the rank of assistant teacher. Three of Krüsi's friends, Tobler, Niederer, and Buss, were called to the Burgdorf institution as additional assistants. The four men had previously arrived at ideas similar to those held by Pestalozzi. They were devoted to, and believed in, disseminating his ideas. They lived under conditions of great poverty, simplicity, and even ignorance, but they lived in an atmosphere of human love. In his *Recollections,* Krüsi says that his life at Burgdorf was broadened, deepened, and enlightened. When Pestalozzi transferred his institution to Yverdon in 1805, he was accompanied by Krüsi. He continued to labor here until 1816, when there arose serious differences among the associates of Pestalozzi because of the arrogant demeanor of the financial manager of the school, Joseph Schmid (see Pestalozzi). Krüsi, Tobler, Buss, Niederer, and the other trusted associates of the great Swiss reformer resigned in a body, and Krüsi organized a private school at Yverdon which he conducted for six years. In 1822 he was called to the principalship of a higher cantonal school at Trogan. Under his administration the school attained distinction, and pupils were sent to it from different parts of Switzerland and from Italy. In 1833 Krüsi was called to the principalship of the new normal school at Gais. The school became well known in Europe, and was visited by many American and English students of education who have left records of their impressions. It was in many important features a replica of the more famous institution at Yverdon. Books, except for reading, were seldom used. The instruction was largely oral, but the pupils had to make their own books, by collecting and organizing the subject matter of class exercises into notebooks. Field excursions for the purpose of studying natural history and local geography occupied considerable time; and walking, climbing, swimming, and systematic exercises in gymnastics formed a part of the physical training of the students. He continued at the head of the cantonal normal school at Gais until his death in 1844. His son, Hermann Krüsi, Jr. (*q.v.*), was first a student and later an instructor in the normal school at Gais. W. S. M.

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KRÜSI, HERMANN, SR. *Erinnerungen aus meinem pädagogischen Leben und Wirken.* (Stuttgart, 1840.) An abbreviated translation of the same in Barnes' *Studies in Education.* First Series. (Stanford University, 1896–1897.)

KYMOGRAPH. — See PSYCHOLOGICAL LABORATORY.

KYOTO, UNIVERSITY OF. — See JAPAN, EDUCATION IN.

KYPHOSIS. — See SPINAL CURVATURE.

LABOR. — See MANUAL LABOR; SOCIETY FOR PROMOTING MANUAL LABOR; also INDUSTRIAL EDUCATION; GILDS AND EDUCATION; MANUAL TRAINING.

LABOR BUREAUS. — See VOCATIONAL GUIDANCE OF SCHOOL CHILDREN.

LABOR, CHILD. — See CHILD LABOR.

LABOR PERMITS. — For school children. See LEAVING CERTIFICATES.

LABORATORY (from Lat. *laborare*, to labor). — Originally the term applied to the shop where the alchemist or chemist elaborated his chemical and medicinal products; now used very generally to indicate the buildings or rooms set apart for conducting practical investigation in any of the sciences. The laboratory furnishes a most important adjunct to any educational institution and is essential in the teaching of any science, and is treated in its various aspects under different captions in the Cyclopedia. The theory of laboratory work is discussed under EXPERIMENT; EXPERIMENTATION, LOGIC OF; EXPERIMENT IN EDUCATION; EXPERIMENT, TEACHING BY; also PSYCHOLOGY, EXPERIMENTAL; SCIENCE; EXPERIENCE; and EMPIRICISM. The function, equipment and operation of laboratories is discussed under each of the natural sciences, as BOTANY, CHEMISTRY, PHYSICS,. etc. Of special educational interest is the treatment under EXPERIMENTAL PEDAGOGY; PSYCHOLOGY, EDUCATIONAL; PSYCHOLOGICAL LABORATORY. In a broader, less technical sense, the term is sometimes used to refer to such work as is described under EXPERIMENTAL SCHOOLS and STATISTICAL METHOD. The literature of the subject will also be found in connection with the articles mentioned above. The historical development of the laboratory is outlined in the historical sections of the articles on the various natural sciences.

LABORATORY METHODS IN MATHEMATICS. — See MATHEMATICS, LABORATORY METHODS IN.

LABORATORY, PSYCHOLOGICAL. — See PSYCHOLOGICAL LABORATORY.

LACE MAKING. — See HOUSEHOLD ARTS.

LA CHALOTAIS, LOUIS RENÉ DE CARADEUC DE (1701–1785). — French magistrate and statesman. He was a striking figure during the prerevolutionary period, and one who exerted a noteworthy influence on the educational thought of his time. His *Two Reports on the Constitutions of the Jesuits* submitted in December, 1761, and May, 1762, to the Parliament of Brittany, of which he was Attorney-general, were largely instrumental in bringing about the suppression of the order in France (1764). Falling into disfavor, he was thrown into prison, and there in solitary confinement wrote a remarkable defense, closing with these words: " Written with a pen fashioned from a toothpick and in ink made from a mixture of chimney soot, vinegar, and sugar, on the paper wrappings of packages of chocolate." " The writings of La Chalotais," said Voltaire, " will live forever." The most important work of his life was probably his *Essai d'Éducation nationale ou Plan d'Études pour la Jeunesse* (1763), whose significance has unfortunately been almost completely overshadowed by Rousseau's *Émile*, which appeared in the previous year. This memoir, looking to the reform of the secondary education of his time, was almost immediately translated into Dutch, Russian, and German. He proposed to substitute for an educational scheme that was primarily adapted for purely school purposes, one that should fit the individual to discharge the duties that devolved upon him as a citizen. After a general introduction on the function of education, the inadequacy of the existing institutions, and the characteristics of the teacher, he laid down general principles for fixing the number of colleges (*i.e.* secondary schools), discussed some general considerations of method, and closed with a carefully elaborated curriculum for the secondary schools. In many of his arguments, especially those on the importance of the place occupied by physical education, on the practical value of modern language study, and on substituting lay teachers for the omnipresent clerical teachers, he was unquestionably far in advance of the prevailing practices of his time. F. E. F.

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Delvaille, J. *La Chalotais, Éducateur.* (Paris, 1910.)
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Robidou. *La Chalotais et les Jésuites.* (Rennes, 1879.)

LACHMANN, KARL (1793-1851). — German scholar and critic, born at Brunswick. He was educated at home and in the local gymnasium, and in 1809 proceeded to the University of Leipzig with the intention of studying theology. He transferred, however, to classical studies which he pursued under Heyne (*q.v.*) at Göttingen, and under Beneke's influence he took up Germanic philology. He took his degree at Halle. After teaching for a time at Berlin and Königsberg, he became professor extraordinary at the University of Königsberg and lectured on German philology. In 1825 he was called to Berlin, and in 1830 became a member of the Academy of Sciences. He edited numerous works in Greek, Latin, and German literature, and introduced new conceptions and new standards in textual criticism. The text, the author, the content and spirit of the work, were all to receive consideration. It was, however, on the purity of the text and the restoration of the original which claimed his chief attention. Among the chief of his editions are those on Propertius (1816), Propertius, Catullus, and Tibullus (1829), *Fables* of Avianus and Babrius, Lucretius (1845-1850), Greek Testament (the introduction containing an exposition of his views on textual criticism, 1850). Lachmann also wrote on meter in Greek poetry, on the dialogue in Greek Tragedy, and edited many early German works. Applying the principles of Wolf's *Prolegomena*, he tried to prove that *Die Nibelungen Not* could be dissected into twenty original lays, and later he divided the *Iliad* into eighteen distinct lays. Of Lachmann's influence Munro says, "Hardly any work of merit has appeared in Germany since Lachmann's *Lucretius* in any branch of literature without bearing on every page the impress of his example."

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LACROSSE. — A game which had its origin with the American Indians under the name of "Baggataway." It was played by two sides, each consisting of a whole tribe, often numbering hundreds of players. The match was started at dawn and continued until one side had scored 100 goals; this often required several days of play from dawn until sunset with a few short periods of rest. From this crude game or battle, the Indians and the white inhabitants of Canada developed the modern game. The number of players was limited to twelve on each team, the size of the playing field decreased to about 125 yards by 50 yards, the goal posts lowered to six feet, the size and shape of the "crosse" or playing stick fixed, and the old buckskin ball replaced by a hard, rubber ball. From Canada the game spread to the United States in 1867 and to Great Britain in 1877. Harvard was the first college to adopt lacross when a team was organized in 1881. Princeton, Columbia, New York University, and Yale soon followed, and the game has gained steadily in popularity with college and preparatory school students.

Lacrosse is a splendid game; the running, dodging, catching, and throwing the ball, serve to develop vitality, speed, agility, and self-control in a large measure. Few games offer as many opportunities for individual skill and team play as lacrosse. Students who are too small for football or rowing often develop into skillful players, for agility and skill are more desired than weight or strength. The game is intensely interesting to spectators and in every way is one of the best games played in the colleges and schools. G. L. M.

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LACTANTIUS FIRMIANUS (c. 250-325). — The last of the Latin apologists, a pupil of Arnobius (*q.v.*). He made Cicero his literary and philosophical model with such success that he was known amongst the humanists as "the Christian Cicero." He attained such eminence as a teacher of rhetoric that Diocletian made him official professor of eloquence in his new capital of Nicomedia, which he intended to make the intellectual and political equal of Rome. Constantine chose him to preside over the education of his heir-apparent, Crispus, in which occupation he spent his closing years at

Trier. He was in no sense an original thinker, but is distinguished for his sound judgment and elegant literary style, the milky softness of which procured for him the name Lactantius. He was a thoroughly consistent example of a Christian philosopher and his writings contain much valuable information as to the ancient systems of Philosophy. His *Divine Institutions* was the first attempt at a systematic exposition of Christian doctrine in Latin. The latter part of his *Epitome* of this larger work is an admirable compendium of religious ethics. His treatise *On the Anger of God*, directed against the Stoics and Epicureans, in which he proves the divine character capable of righteous indignation, was highly praised by St. Jerome. *The Workmanship of God* is a discussion of the anatomy of the human body and the nature of the soul in opposition to the Epicurean Philosophy. He adopts the Creationist view, affirming that the soul is the immediate workmanship of God without human coöperation. His book on the *Deaths of the Persecutors* is a résumé of the various persecutions from the time of Nero and is of prime importance to the historical student. His treatise on *Grammar* is lost.

W. R.

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SMITH, SIR WM., and WACE, H. *Dictionary of Christian Biography* contains a valuable article on Lactantius.

LADY MARGARET HALL, OXFORD. — See WOMEN, EDUCATION OF; OXFORD UNIVERSITY.

LAFAYETTE COLLEGE, EASTON, PA. — A Presbyterian college opened in May, 1832, under the presidency of Rev. George Junkin, D.D. A scientific school was established in 1865 through the liberality of Ario Pardee, Esq. The college department now maintains three courses of study, Classical, Latin Scientific, and General Scientific, leading to the degrees of A.B., Ph.B., and B.S.; and the technical school courses in civil, mining, electrical, and mechanical engineering, and analytical chemistry leading to the appropriate degrees. The entrance requirements are fifteen units. The faculty (1911) consists of fifty members and the students number 560, — 286 in the college, and 254 in the technical school, with twenty pursuing graduate studies. The college is beautifully located at the junction of the Lehigh and Delaware rivers. The grounds occupy sixty acres. The buildings number fifty. Among those who have given distinction to the college are Professor James H. Coffin, LL.D., author of *The Winds of the Globe*, whose discoveries as to cyclonic storms are the basis of the forecasts of the Weather Bureau, and Professor Francis A. March, LL.D., L.H.D., D.C.L., who was one of the pioneers in the philological study of the English language. Ethelbert D. Warfield, D.D., LL.D., has been president since 1891.

LAGGARDS IN THE SCHOOLS. — See RETARDATION, AND ELIMINATION OF PUPILS.

LAKANAL, JOSEPH (1762-1845). — French statesman, teacher, and, after Condorcet (*q.v.*), the most important of the educational leaders of the Revolutionary period. He was a member of the National Convention, and of the Council of Five Hundred. His position in educational history rests exclusively upon his activity as member of the Committee of Public Instruction in the former body. The bill, of which he was joint author with Sieyès and Daunou (*q.v.*), presented to the Convention, June, 1793, provided that the state assume the support of elementary instruction, and that secondary and higher education (barring some few subsidized higher institutions) should be left to private initiative. This bill shared the fate of so many of the projects of the Revolutionary assemblies and was set aside for another (the plan of Lepelletier). It was the report of Lakanal (February, 1795) that resulted in the foundation of the *Écoles centrales* (central schools), which bridged the gap in secondary education between the passing of the old régime and the establishment of the lycées by Napoleon in 1802. Lakanal's most distinctive work was his report (October, 1794) which provided for the foundation of the Normal School (see NORMAL SCHOOL, HIGHER). After the defeat at Waterloo, Lakanal came to the United States, where he spent some twenty-two years among his fellow countrymen in the south, residing at New Orleans for a part of the time. He returned to his native country in 1837, and there spent the remainder of his life.

F. E. F.

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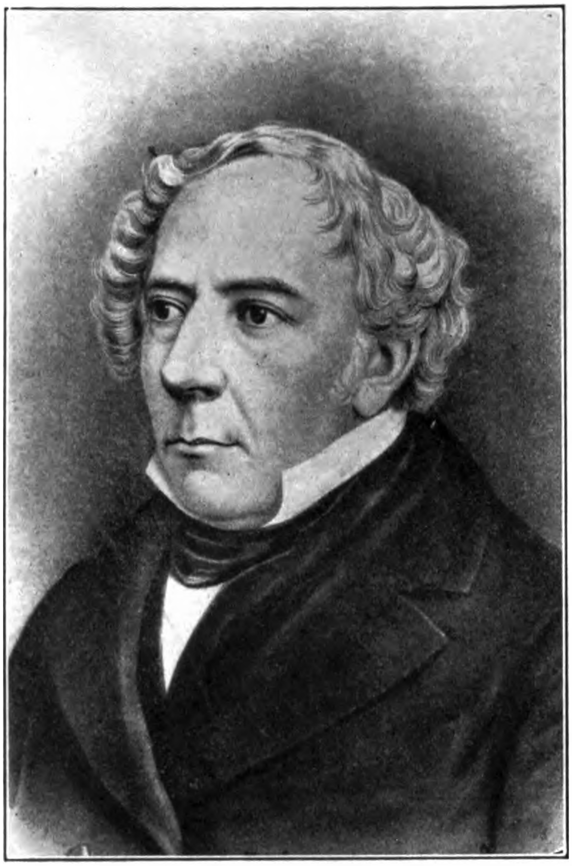
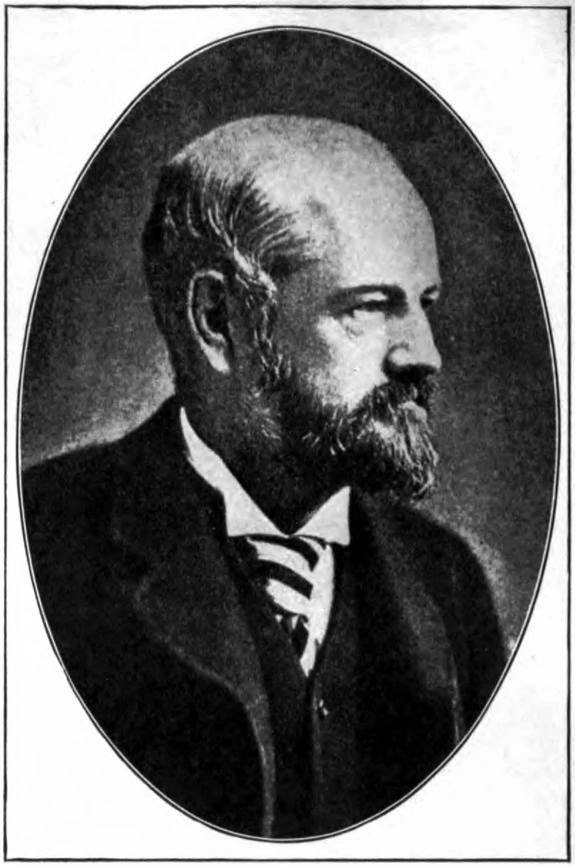
LEGENDRE. *Lakanal.* (Paris, 1882.)

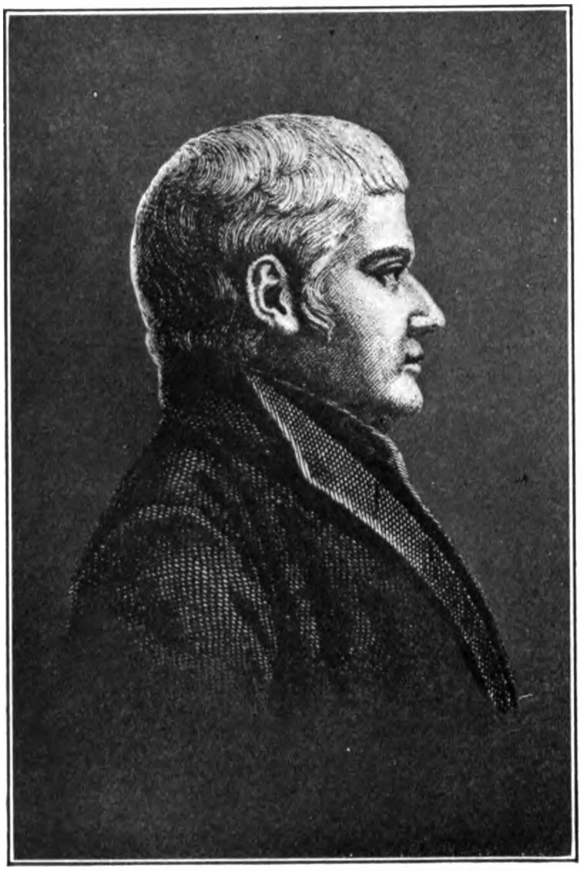
SAINT-HILAIRE, G. *Lakanal, sa Vie et ses Travaux.* (Paris, 1849.)

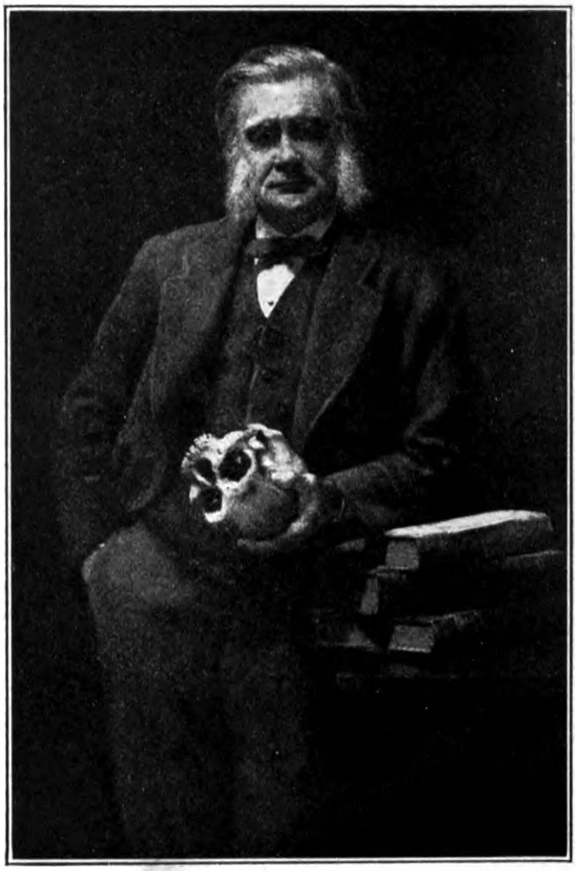
LAKE ERIE COLLEGE, PAINESVILLE, OHIO. — An institution founded in 1847 as the Willoughby Seminary at Willoughby, Ohio, for the higher education of women, and moved to its present location in 1856, where instruction was begun in 1859. The present title was adopted in 1908. The entrance requirements are fifteen units, candidates being admitted by examination or by certificate from accredited schools. The college confers the degree of A.B. The enrollment in the college in 1911-1912 was 118. There are thirty members on the teaching staff.

LAKE FOREST COLLEGE, LAKE FOREST, ILL. — Founded in 1857 as the Lind University by a company formed for the pur-


Sir William Hamilton (1788-1856). See p. 213.


Quintin Hogg (1845–1903). See p. 300.


Joseph Lancaster (1778–1838). See p. 621.


Thomas Henry Huxley (1825–1895). See p. 352.

A GROUP OF ENGLISH EDUCATORS.

pose of establishing a residence suburb and an educational institution within easy distance of Chicago. In 1865 the legal title of the institution became the Lake Forest University. Collegiate work with a four years' course was not begun until 1876; up to that date a secondary education was provided for boys in the Lake Forest Academy, and for girls in Ferry Hall. Attempts were made from time to time to develop professional, schools but in 1902 it was decided to confine attention to the development of the academic and collegiate departments only. The entrance requirements are sixteen units. The degree of A.B. is conferred on students who complete the required courses, which are arranged according to the group system. The A.M. is granted after a year of residence work and a thesis. In 1911–1912 there were enrolled in the college 185 students. The faculty consists of eighteen members.

LALOR, THERESA (1766–1846). — Founder of the first Roman Catholic school for girls in the United States. She opened a school for Catholic girls in Philadelphia in 1797. Two years later she took charge of the girls' school founded at Georgetown and in 1808 she became the mother superior of the Convent and Academy of Visitation. Five convents of her order were established in the United States. W. S. M.

LAMARCK. — See EVOLUTION, SCIENTIFIC THEORY OF.

LANCASTER, JOSEPH (1778–1838). — The English educator and advocate of the monitorial system (*q.v.*). He was born in Southwark (London) on the 25th of November, 1778, the son of a small tradesman. Precocious piety and copious speech seemed to justify his parents' hopes that he would become a Dissenting minister, but he disappointed them by joining the Quakers, a sect without paid preachers. After being occupied for some time as usher, he (probably in 1798) opened a school on his father's premises. His enthusiasm and his natural aptitude for managing children combined with the food and clothes, which the benevolence of some Quakers enabled him to distribute during a severe winter, made his school so popular that it had to be transferred twice or thrice into larger rooms. Lancaster was nearly overwhelmed by his success. His pupils were too many for him to teach alone and he could not afford to pay for help. The idea, therefore, occurred to him of making those who knew a little teach those who knew less. Being entirely ignorant of the history of education, he thought that the idea was new, and he embodied it in a system of discipline and instruction showing considerable ingenuity. As he also invented sundry money-saving devices, such as substitutes for reading books and copy books, he reduced the cost of maintaining a school.

Lancaster was so proud of his system that in 1803 he published *Improvements in Education as it respects the Industrious Classes of the Community, containing a Short Account of its Present State, Hints towards its Improvement, and a Detail of some Practical Experiments conducive to that End.* The fact that a second edition was published the same year proves the author's success in "pushing it." He had now begun to seek supporters outside the circle of his coreligionists. The earliest of his noble patrons were Lord Somerville and the Duke of Bedford; the most exalted was George III, with whom he procured an interview in 1805. The king listened patiently to a long account of the "System," expressed a wish that every poor child in his dominions should be taught to read the Bible, promised to subscribe a £100 a year, and put down the Queen for £50 and the Princesses for £25 each.

The royal favor expanded both the enthusiasm and the imprudence of Lancaster. He had already, with only a fraction of the cost assured, built a large schoolhouse in the Borough Road; he now added a printing press and a slate manufactory; he started a model rural school, and traveled in state to deliver lectures advocating the establishment of other schools. Toward the end of 1807 his debts were over £6000 and he was arrested. On Jan. 22, 1808, William Corston, Joseph Fox, and he, meeting at Corston's house on Ludgate Hill, formed themselves into a "Society for the purpose of affording education . . . to the children of the poorer subjects of George III." (See BRITISH AND FOREIGN SCHOOL SOCIETY.) In July William Allen (*q.v.*) and others were added to the Committee. The members made themselves responsible for Lancaster's debts, undertook to manage his financial affairs, and released him for missionary journeys. As these resulted in the establishment of a good many schools, all requiring masters trained in the System, the business gradually grew too big for the original Committee, to which in December, 1810, more than forty noblemen, statesmen, and philanthropists were added.

In 1812 Lancaster, against the advice of his friends, started a boarding school in which his System was to be applied to secondary education. This was a private speculation which in a year brought him to bankruptcy. The institution in the Borough Road was not involved in his ruin, as the Committee, anticipating it, had induced him, for valuable consideration, to relinquish his legal title to the premises. In order to acknowledge his past services and provide for his future needs, the Committee created the post of superintendent of the schools with nominal duties and a liberal salary, but irritable vanity prevented his trying to coöperate with the men who had been his generous and disinterested supporters, and in April, 1814, having persuaded an unsuspecting foreigner to provide the capital for starting a rival school in a neighboring street, he resigned his appointment. The rival school was a failure and Lancaster, having alienated the sympathies of the public, sank into obscurity and distress.

In 1818 he resolved to abandon his ungrateful country and begin a new life in the New World. Lancaster's System had preceded him and he was warmly welcomed from Albany to Washington. He made his first home at Philadelphia, but "rumors of debt and discreditable pecuniary transactions in England" rendered cordial relations with the Quakers impossible and he moved on to Baltimore. There he opened an "institute," but it does not appear to have been very successful and in 1825 he was glad to accept an invitation from Bolivar, the "Liberator" of South America, to organize schools for the young Republic. In less than two years he fell foul of the President and was compelled to leave Caracas.

Information respecting the remainder of his life is very fragmentary. We catch glimpses of him here and there lecturing or teaching, sometimes enjoying brief prosperity, sometimes sick and poor. In 1827 he was at New Haven; in 1828 the City of New York voted him $500; in 1829 he went to Canada, where the Parliament made several grants to enable him to carry on his experiments in education, but in 1833, having quarreled with the Speaker, he returned to the United States. From New Haven he issued an appeal for aid pending the first payment of an annuity which the leading members of the British and Foreign School Society were subscribing to buy for their old traducer. In September, 1838, he was arranging to return to England, but an accident in a New York street ended his life on the 23d of the next month.

For about seven years after his interview with the king, Lancaster was the center of an extensive and passionate controversy. He was assailed on personal and on religious grounds. He was accused, quite unjustly, of having stolen his System from Bell (*q.v.*) and said to have invented nothing except its defects. The greatest of these was its catholicity. Lancaster and his supporters maintained that in schools attended by the children of all sects the teaching should not be distinctive of any sect. Bell's supporters maintained that the doctrines of the Established Church should be taught. The personal controversy has long ceased to interest, but the religious controversy is still unsettled in England. A hundred years ago it had one beneficial result, — it led to the establishment of many schools in emulation or in rivalry. D. S–N.

For portrait, see p. 621.

See MONITORIAL SYSTEM.

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LANCELOT, CLAUDE (1615–1695). — One of the most influential teachers in the schools of Port-Royal (*q.v.*) none contributing more to the fame of the society by his pen than he. His most notable writings were unquestionably a series on learning foreign languages, the first being: *Nouvelle Méthode pour apprendre facilement la Langue latine* (1644). This was intended as an abbreviated form of Despautère, the grammar then in almost universal use, but all its rules were in French verse, whereas those in the older text had been in Latin verse. This was followed by similar texts: Greek (1655); Italian (1660); Spanish (1660).

F. E. F.

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LANCING ST. MARY AND NICHOLAS COLLEGE, SHOREHAM, SUSSEX. — See GRAMMAR SCHOOLS; COLLEGE; COLLEGE, ENGLISH; PUBLIC SCHOOLS.

LAND GRANT COLLEGES. — See AGRICULTURAL EDUCATION; NATIONAL GOVERNMENT AND EDUCATION.

LAND GRANTS FOR EDUCATION. — See NATIONAL GOVERNMENT AND EDUCATION.

LAND, SCHOOL. — See SCHOOL FUNDS; NATIONAL GOVERNMENT AND EDUCATION.

LANDERZIEHUNGSHEIME. — See DEUTSCHE LANDERZIEHUNGSHEIME; BOARDING SCHOOL.

LANDER COLLEGE, GREENWOOD, S. C. — An institution for the education of girls and young women under the auspices of the South Carolina Conference of the Methodist Episcopal Church, South. The institution was founded in 1872 as the Williamston Female College and was moved to its present location in 1904 under the new title. Subcollegiate, collegiate, and music and art courses are offered. Ten admission units are requirements. By its charter the college is authorized to grant degrees. The faculty consists of nineteen members.

LANDSMANNSCHAFT. — The name of one type of Student Association in the German universities originating in the early part of the seventeenth century. They were originally groupings of students according to the district from which they came within each nation. (See UNIVERSITIES.) For a long time the residence qualification was adhered to, but later, membership was thrown open. When the *Burschenschaft* (*q.v.*) arose (about 1860), many of the *Landsmannschaften* were dissolved and joined the new movement. When the *Burschenschaften* were suppressed (following the revolutionary period of 1830), the name *Corps* (*q.v.*) was assumed by many organizations. For a time there was no distinction between *Corps* and *Landsmannschaft*, but since 1888 the latter have a separate central organization, the *Coburger Landsmannschaften-konvent* and a periodical, the *Landsmannschaften-konventzeitung*. In point of organization and exclusiveness the *Landsmannschaft* more nearly resembles the *Corps* than the *Burschenschaft*.

See STUDENT LIFE.

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LANE, ALBERT GRANNIS (1841–1906). — School superintendent, educated in the public schools of Chicago. He was principal of the Franklin School, Chicago (1858–1869; superintendent of Cook County, Illinois (1868–1873 and 1877–1891); city superintendent of the schools of Chicago (1891–1898) and assistant superintendent (1898–1906). He was active in the National Education Association and was the author of a number of papers on educational subjects. W. S. M.

LANE THEOLOGICAL SEMINARY, CINCINNATI, OHIO. — Established in 1829, organized under the Presbyterian church of the United States to educate young men for the ministry. All candidates must be members in full communion with some evangelical church, and for the admission to the full course should be graduates of a college or university. Diplomas are granted on completion of the full three years' course.

LANFRANC (*c.* 1005–1089). — Archbishop of Canterbury; born at Pavia. He studied law for a time, but on his father's death he went to France, and with a band of scholars opened a school at Avranches in 1039, which attracted many students. Determining to devote himself to a religious life, he went to the monastery at Bec, where he opened a school which was attended by students from France, Germany, and Italy. In 1070 Lanfranc became Archbishop of Canterbury, and in that position did much to promote learning in England by introducing and preferring foreign clerks. Lanfranc was especially interested in the Cathedral of Canterbury, which was in the hands of monks. The *Constitutions of Lanfranc* deals with the charge and conduct of oblates and young novices; but, except for a reference to reading, no mention is made of their instruction. Lanfranc was the author of many works; the chief of these is the *De Corpore et Sanguine Domini nostri*, a defense of transubstantiation against Berengarius of Tours.

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LANGDON, SAMUEL (1723–1797). — Eleventh president of Harvard College, from which he graduated in 1740, He taught at Portsmouth, N.H. (1740–1745), engaged in the work of the ministry, and was chaplain in the colonial army. He was president of Harvard College from 1774 to 1780, and the author of a number of philosophical and religious works. W. S. M.

LANGE, FRIEDRICH ALBERT (1828–1875). — Philosopher, born Sept. 28, 1828, at Wald near Solingen in Westphalia, the son of a pastor who afterward became a well-known professor of theology. After attending the gymnasia of Duisburg and Zürich, he studied classical philology at Zürich and Bonn, and taught for ten years (1852–1862) in the gymnasia of Cologne and Duisburg and the University of Bonn. Resigning his position at Duisburg for political reasons, he became the editor of a liberal paper and secretary of the chamber of commerce of Duisburg, took an active interest in labor unions and various social reforms (coöperative societies, consumers' leagues, loan societies), and delivered popular lectures on philosphy. His celebrated work on the *History of Materialism* (translated by E. C. Thomas, 3 vols., 1892) first appeared in 1865 (second edition revised and enlarged, 1873–1875; later edition edited by Cohen) and was followed by two able economic treatises: *The Labor Question*, 1865, and *J. S. Mill's Views on the Social Question*, 1866. During this active period he also contributed a number of excellent articles on education to Schmid's well-known *Encyclopedia* and worked on his *Logical Studies*, which was published after his death (1877). In consequence of antagonism to his radical social and political views, Lange resigned his positions (1866) and removed to Switzerland where he devoted himself to journalism, business, politics, and teaching, until 1872, when he was called from his professorship of philosophy at Zürich to a similar chair at Marburg. Here he died, Nov. 21, 1875, in the bloom of his manhood, a victim of his strenuous devotion to work.

Lange endeavored to reconcile the prevailing scientific realism of his age with the traditional idealism by going back to Kantian critical idealism. For him materialism is a legitimate working hypothesis for the mental as well as the physical sciences, but impossible as an ultimate philosophy in view of Kant's criticism and the physiology of the sense organs; while speculative idealism belongs with religion and art to the realm of poetry, which, however, have a high value for the life of man. We cannot reach certain and objective knowledge in religion and metaphysics through reason and understanding: their value lies in their subjectivity, in their being the highest realization of the individual's spiritual self. And though natural science too is merely the product of man's mental organization, its value rests upon the elimination of self, of all teleological, emotional, religious, æsthetic, and moral presuppositions. Natural science must be supplemented by a critical idealistic philosophy, the real world by the world of values, the world of ideals.

In education Lange demanded that we keep in mind both the ethical goal and the psychological factor; pedagogy must employ the political sciences, physiology, and modern empirical psychology, and become an empirical science of national education. He criticized many of the tendencies and methods common in Germany, the mania for centralization and uniformity, the mechanization of instruction, the position of religious instruction in the curriculum, and pleaded for greater freedom and elasticity, for physical training, for training in citizenship, for realistic studies, for better training of teachers, and recommended many reforms which have since been adopted.

F. T.

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LANGEN, RUDOLPH VON. — See Renaissance and Education.

LANGLEY, JOHN (d. 1657). — Headmaster of St. Paul's School, London, 1640–1657. He was born near Banbury in Oxfordshire, graduated B.A. from Magdalen Hall in 1616, and became schoolmaster at Gloucester in 1617, where he stayed till 1627. In 1643 he was one of the licensers of the press for books of philosophy, history, poetry, morality, and arts. Langley wrote *Totius Rhetoricæ Adumbratio in usum Paulinæ Scholæ* (1644) and an *Introduction to Grammar.* Dr. Edward Reynolds, afterwards Bishop of Norwich, who preached Langley's funeral sermon, 1657, spoke of Langley as "a learned man, a historian, cosmographer, and a great antiquary in the most memorable things of this Nation." He thus entered into the tradition of the great antiquary-schoolmaster, William Camden (*q.v.*), and marks the growing tendency toward widening the field of interest of schoolmasters beyond the merely classical to the recognition of the claims of England, in its language, history, and literature, to the attention of masters and pupils of English schools.

F. W.

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Reynolds, Edward. *A Sermon touching the Use of Human Learning, preached in Mercer's Chappel, at the Funeral of that Learned Gentleman, Mr. John Langley, late Schoolmaster of St. Paul's School in London, on the 21st day of September, 1657.* (London, 1658.)

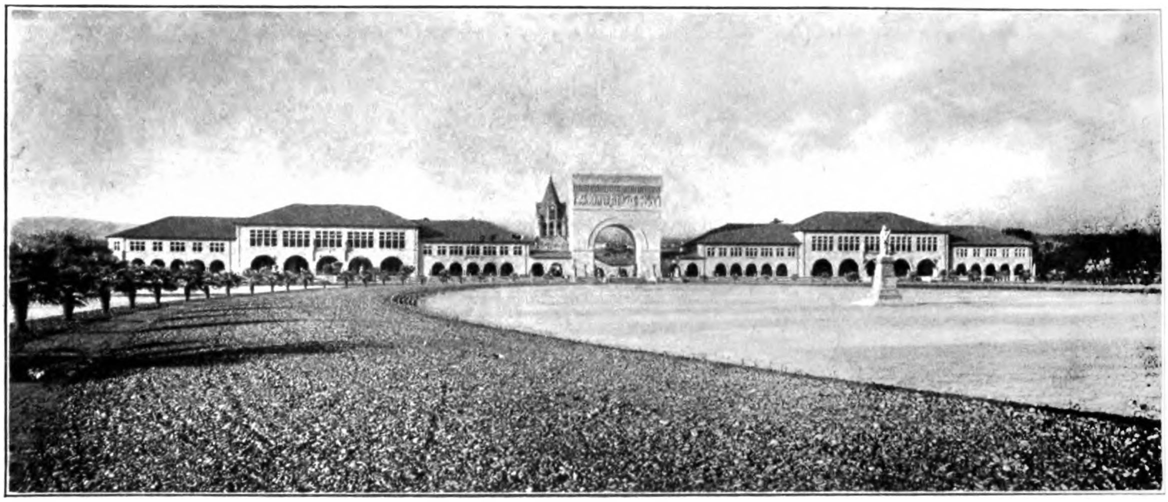
LANGUAGE, ENGLISH. — The English language as a clearly differentiated branch of scientific and academic study was not fully recognized until the development of the modern science of philology. In the seventeenth century interest in the antiquities of the English people had led to a certain amount of examination of the language of the older periods, mainly with a view to the translation of Anglo-Saxon texts and their use in ecclesiastical history and polemics (see Anglo-Saxon). Although these earliest investigations were not carried on in a thorough or systematic way, a number of works were then written, *e.g.* grammars and dictionaries (*q.v.*), which were of some use to later students of the language. In the succeeding century students of language were interested in the subject mainly from a philosophical point of view, and attempts were made, always upon an insufficient basis of fact and observation, to explain language as a universal human activity according to the rules of a systematic logic. Attention being directed mainly to theory, the study of the facts of the speech languished. Of the English philosophical linguists one of the most ingenious was Lord Monboddo, James Burnett, who published his *Origin and Progress of Language* in six volumes, from 1773 to 1792. More representative of linguistic scholarship specifically, and perhaps the most important work of the eighteenth century dealing with the English language, is J. Horne Tooke's *Epea Pteroenta, or the Diversions of Purley,* the first volume of which appeared in 1786. This work, which is concerned mainly with etymology, was undertaken in a casual way as result of a lawsuit in which Tooke was concerned, the decision of which turned upon the meaning of certain English prepositions. Although the book is full of the wildest theoretical derivations of words and of unfounded linguistic generalizations, it nevertheless shows considerable information and even scholarship of a miscellaneous and unsystematic kind. It serves as a fair index to the state of knowledge with respect to language in its time, and shows also that the lack of a proper method was the main reason why much of the linguistic investigation of the philosophical students of language has proved unsound and valueless.

The historical and scientific study of language according to modern methods begins with the foundation of the science of philology in the early nineteenth century. The scholarly point of view with respect to the study of the individual languages, *e.g.* English, French, German, etc., has in general followed the changes in the theoretical conception of the whole subject of philology (*q.v.*). Two important and differing conceptions of philology may here be noticed. The first and earlier of the two is that which was formulated by Friedrich August Wolf (*q.v.*) in his various writings on classical antiquity, especially the literature and art of Greece. It was left to his followers, Boeckh, H. Paul, and others, to extend his conception of philology to other civilizations, especially to the Teutonic civilization of Europe. The greatest achievement of the Wolfian conception of philology has been the production of the *Grundriss der germanischen Philologie* (2d ed., Vol. I, 1896), under the general direction of H. Paul, but with the collaboration of various scholars in special fields. The inherent difficulties of the synthetic Wolfian conception of philology, and the natural tendency of all such studies toward greater differentiation and specialization, prepared the way for the second and more analytic conception of philology, which is the one prevailing to-day, at least in practice, and the one which has been most fruitful of results. This theory of philology makes the subject in many respects coincidental with the science of linguistics, the tendency in this direction being apparent even in Paul's *Grundriss* from the greater relative importance of the fifth, the linguistic section, as compared with the other sections of the book. The founder of the modern science of philology or linguistics, as distinguished from Wolf's imaginative and poetical conception of the subject, is usually assumed to be Franz Bopp (*q.v.*), born 1791, who chose as his particular subject of investigation the origin of the inflectional system of the Indo-Germanic languages. Bopp's method was comparative; and in the course of his investigations he not only arrived at a theory of his own with respect to the origin of inflection, but a more important result of his work was the detailed proof of the common relationship and origin of the Indo-Germanic languages, a fact which had been guessed before Bopp's time, but never credibly demonstrated. The conclusions of Bopp established the comparative method of linguistic investigation upon a sound basis, and this method has more or less colored all subsequent study of language. Still further differentiation was brought about by Jacob Grimm (*q.v.*), who published in the year 1819 the first volume of his *Deutsche Grammatik.* To Grimm belongs the credit of first clearly formulating the methods and the laws of the historical study of language. His procedure, familiar to every novice to-day, was to place the various forms of a special language, English for example, in a chronological sequence from Anglo-Saxon to Modern English, the conclusions drawn being those which arose immediately from the observation of the facts thus arranged. Grimm declared himself hostile to all general abstract and logical ideas in the study of language, thus placing himself squarely in opposition to the philosophical and logical school of linguists, which still flourished in his day. Grimm also regarded language as a purely social product, subject to the laws of natural growth, like all other human institutions; and although this aspect of language was not extensively developed by him, he deserved credit for being one of the first to perceive it clearly. Grimm likewise deserved recognition for being the first student of language to see clearly the importance of the sounds of language, historically considered, and also of the forms of a language other than the standard language, that is, of the popular dialects, for the understanding of the history of the language. One other distinction Grimm also may claim, that of being one of the earliest scholarly editors of Teutonic texts, Anglo-Saxon as well as German. Grimm, with his many-sided activity, may stand, therefore, as a type of the best among historical philologians; and the value of his methods may be inferred from the fact that the results of his investigations are to a large extent accepted to this day.

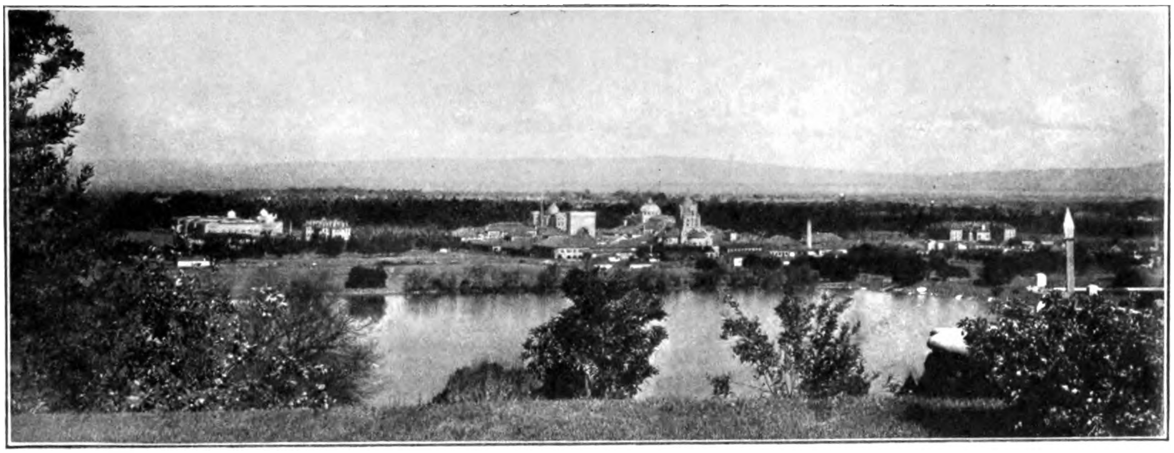
The aim of the historical student of language is theoretically less ambitious than that of either the Wolfian philologist or the comparative student of language, but as his field of observation becomes more restricted in extent, it is covered in a correspondingly more detailed and exact way. The final purpose of the historical students of the English language has been so to search and elucidate the material of the language as to enable them to present a complete picture of it. To this end the student must devote himself to the minute study of all the objective facts of the language, in phonetics, in morphology, in vocabulary, and in syntax. Before such a vast array of facts can be presented in a systematic way for any single language, a great deal of counting, cataloguing, and classifying is necessary, investigation of a more or less mechanical and statistical type, which the modern student, at least of English, thanks to the earlier investigators, to a considerable extent escapes, but which is still sometimes unjustly made the reproach of linguistic specialization by those who are hostile to it; it should not be forgotten, however, that the present simplicity and system in the history of the language are largely the result of statistical labors, laws in language being nothing more than observation of individual instances. Having thus gathered and classified the facts of his language, the historical student, by placing them in chronological sequence, shows that later usages arise regularly out of earlier, such observations constituting a rule or law of the development of the language. In general the earlier historical students of language concerned themselves but little with the causes or the psychological or physical explanations of the laws which they recorded. They looked upon it as their task to state empirical laws, trusting that when a sufficiently large area of observation had been thus covered, many questions that appeared difficult of solution would be answered of themselves. In this hope they were not disappointed; but obviously a mere descriptive statement of the facts of a language is not all that can be expected of the historical student, and it is now assumed that the descriptive laws are preliminary to the explanation of the meaning of the facts as illustrating general social and psychological processes in language. This fuller realization of the significance of psychological activities and of social custom in language is due to the investigations of Paul, Steinthal, and in general of the contemporary school of linguists; the study of the physical side of language by the flourishing modern school of phoneticians has been productive of particularly valuable results.

These are, in general, the principles upon which the modern scientific study of language is based; but a brief summary of the more important results of the historical and descriptive study of the English language will best show what has been accomplished and what remains to be done in that particular field. In the first place the duty of the student of language concerning which there would probably be least difference of opinion, that of transferring the early literary monuments of the language from perishable and inaccessible manuscripts to multiplied printed copies, assuring their preservation and general accessibility, has been performed. The important manuscripts have been transcribed and printed, most of them having been published in the volumes of the Early English Text Society. Some of the manuscripts have been photographed, but this method of producing exact mechanical copies of the originals has not as yet been extensively employed, although the time is doubtless not far distant when at least valuable manuscripts will thus be brought within the reach of all libraries. Unless unexpected and startling discoveries are made, there is consequently nothing to be added to the published documents that will, in any material way, alter the conclusions concerning the English language which may be drawn from those now available. This does not mean, however, that the editing of English texts is a closed account. The Early English Text Society publishes lists of unedited manuscripts which should be copied and printed, and new editions, taking account of the results of more recent investigations, of much of the literature of the Old and Middle English periods are greatly to be desired. There is at present no edition of the *Beowulf*, the most important monument before the Conquest, in English or in German, which gives an adequate and comprehensive treatment of the poem. The text has been frequently printed, accompanied by glossaries and textual comment; but there is no modern summing up of the poem in all its aspects as an historical and literary record. With a few notable exceptions, the same is true of the main monuments of Anglo-Saxon literature, verse and prose, and in the preparation of exhaustive editions of the texts now available the English scholar has an important and pressing service to perform. Middle English texts have been, on the whole, more thoroughly edited than Anglo-Saxon, and of recent years some attention has been given to the careful editing, from a linguistic as well as literary point of view, of texts of the Early Modern English period, especially of dramatic texts.

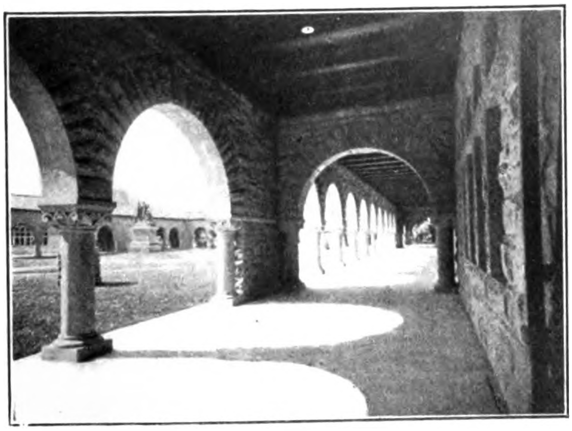
In the study of the sounds, the inflections, the vocabulary, and the syntax of the language, much has also been accomplished. The treatises of Ellis, Sweet, Jespersen, Sievers, and others present a fairly comprehensive history of English sounds. The questions which await solution are more or less minor ones of the limits of dialects, of the values of occasional manuscript symbols, of the individual characteristics of certain writers, etc.; besides, of course, many theoretical questions of the origins, the causes, and the processes of sound changes. The study of English inflections has been carried much nearer completion than that of English sounds. The progressive changes in the system of English inflections, from Old to Modern English, their chronological divisions and dialectical variations, are subjects of elementary knowledge to the student of the language, and may be easily observed in the many schematic statements in the various manuals and histories of the language. On the other hand, the growth and development of the vocabulary, from the complex nature of the subject, is less readily presented in historical survey. The outlines of the subject may be followed in the various publications of Professor W. W. Skeat, who has made this field particularly his own; and the material for a comprehensive history of the English vocabulary is being gradually presented in the volumes of the *New English Dictionary*. The syntax of the language, on the other hand, although it has been by no means a neglected field, still presents its main problems unsolved, and, in



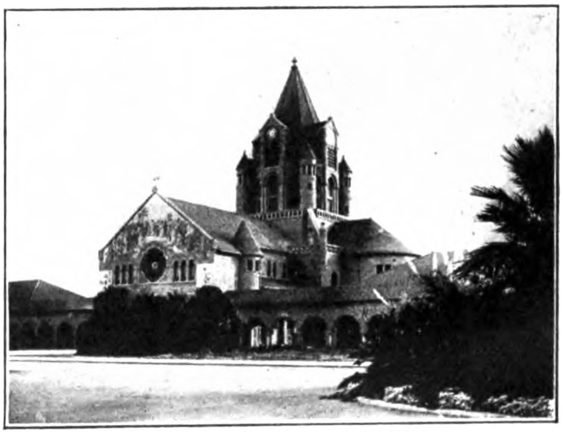
Main Entrance and Façade.



Bird's-eye View from Foothills to the Rear.



An Inner Court.



Memorial Church.

LELAND STANFORD JR. UNIVERSITY.

fact, unstated. The results of syntactical investigations in English seem to be out of proportion to the amount of time and application which have been spent on them, and certainly are not equal in importance and generalizing value in their own field to the results of linguistic investigations in other directions; for example, in phonetics or morphology. The reason for this is probably to be found partly in the inherent difficulty of the subject and partly in the lack of an intelligible and generally accepted method. Syntax may be defined as the study of language as it takes form in the expression of thought, that is, of the formation and combination of sentences. It includes thus not only the use of the various cases, tenses, moods, genders, etc., according to the laws of concord, but also all departures from grammatical norms, word order, phrasing and the grouping of complex ideas, perhaps also the use of tones and inflections of the voice, of gesture and facial expression in coloring and assisting the meaning of the phrase. A complete syntax of the language would naturally include not only the written literary language, but also the colloquial spoken language of everyday intercourse, as the dictionary does, for example, in the treatment of words. Such a syntax of the language as is here described may possibly never be written, since the difficulty of reducing the multitudinous facts of observation to systematic statement seems humanly almost insurmountable. Consequently no attempt has ever been made to write a descriptive, historical syntax of the language, parallel to the descriptive statements of inflections, sounds, and vocabulary. In general it would seem that in the study of syntax the historical method must take a secondary place, and must serve as a guide and corrective to the student, rather than as an end in itself. It is possible that by studying all the recorded forms of a past period, for example, the Old English period, an approximately complete norm of Old English syntax could be realized; and by placing beside this norm a transition English, a Middle English, and a Modern English syntax, to mention only the larger chronological divisions, conclusions of far-reaching significance would undoubtedly result. But a complete normal syntax for any one period is still far from realizable, much less a series of syntactical pictures for a group of successive periods. More practicable than such an endeavor to build up a general descriptive and historical syntax of the English language is the attempt to show how and why different specific syntactical forms arose. The historical study of the phenomena thus takes its place as an aid in the psychological explanation of them. Instead of placing before himself the hopeless task of comprehending the whole vast structure of the language, the syntactical student may more profitably limit himself to following out the psychological principles underlying certain forms or groups of forms that have their principle of unity within themselves. He may thus disregard and free himself of the burden of the obvious and the indifferent, and give his attention to those phenomena which will enable him to gain some insight into the spiritual life which serves as a background for the language, and which carry with themselves results which may be intelligently estimated and valued.

The work which, better than any other, may serve as an index to and a summary statement of the results of the modern scientific and historical study of the English language is the *New English Dictionary*. This work originated from a suggestion of Archbishop Trench, who in the year 1857 proposed the collection of materials for a new dictionary which should be a worthy record of the English language. This collection of references was immediately begun, quotations being taken "from all the great English writers of all ages, and from all the writers on special topics whose works might illustrate the history of words employed in special senses, from all writers whatever before the sixteenth century, and from as many as possible of the more important writers of later times" (Preface to Vol. I, p. 5). The dictionary is, therefore, not a compilation from older dictionaries, but all the material used in it was collected for this specific purpose. "The aim of the Dictionary is to furnish an adequate account of the meaning, origin, and history of English words now in general use, or known to have been in use at any time during the last seven hundred years. It endeavors (1) to show, with regard to each individual word, when, how, in what shape, and with what signification it became English; what development of form and meaning it has since received; which of its uses have, in the course of time, become obsolete, and which still survive; what new uses have since arisen, by what process, and when; (2) to illustrate these facts by a series of quotations ranging from the first known occurrence of the word to the latest, or down to the present day; the word being thus made to exhibit its own history and meaning; and (3) to treat the etymology of each word strictly on the basis of historical fact, and in accordance with the methods and results of modern philosophical science" (Vol. I, p. 6). The first volume of this work, published by the Clarendon Press, Oxford, appeared in 1888, and the whole is now nearing completion, the latest section (1911) coming down to "Tezkere." In its combination of thoroughness with exactness, the *New English Dictionary* represents the highest achievement of modern English scholarship. It is sometimes called the *Oxford Dictionary*, from the place of its publication, or *Murray's Dictionary*, from the name of its general editor.

In the academic development of the subject, the scientific study of the English vernacular made its way much less rapidly in England than in Germany. In the latter country the study of the modern Teutonic languages, English among others, had already been extensively developed by such scholars as Bopp, Grimm, Schleicher, and others, before it received recognition in England in the appointment of Max Müller to the chair of comparative philology in the University of Oxford, in 1868. The explanation of the fact that German scholars have devoted so much time to the historical study of English is obviously to be found in the practically equal significance of the earlier periods of English for the history of English and German. The main stress in these earlier studies was therefore placed upon the comparative aspects of linguistic history. Only slowly and with difficulty did the study of the English language specifically detach itself from the larger subject of comparative philology. Aside from the Rawlinsonian Professorship of Anglo-Saxon (see ANGLO-SAXON), no official provision was made in the University of Oxford for the study of the English language until the establishment of the Merton Professorship of English Language and Literature in 1885. Only within the last twenty-five years, consequently, has the study of the English language received final recognition as a distinct and important part of the curriculum of an English university.

In America specific provision for the study of the English language by the creation of professorships in English philology or English language has also been made only in recent years. Among earlier linguists, for example, William Dwight Whitney was first Professor of Sanskrit in Yale University, after 1870 Professor of Comparative Philology; Francis James Child was Boylston Professor of Rhetoric and Oratory in Harvard University from 1851 to 1876, and after the latter date Professor of English. A pioneer student and teacher of the English language in America is Francis A. March (*q.v.*), since 1856 Professor of English Language and Comparative Philology in Lafayette College. Within the past generation the study of the English language has grown rapidly in Continental, English, and American universities. Whether or not special provision is made for such work by the appointment of a professor of the English language, courses are now given in all universities which cover the various aspects of the history of the language, at least in the earlier periods of Anglo-Saxon and Middle English. The modern period, for obvious reasons, is much less generally studied than the earlier periods. The historical study of the language remains, however, largely a university subject. Apart from their purely scholarly and scientific significance, university courses in the English language are usually regarded as a part of the preparation of prospective teachers of English in secondary schools or colleges. But in recent years a number of non-technical manuals of the history of the English language have been written, not from the point of view of rhetorical usage, but from a more purely linguistic position; and with the help of these books the historical study of the vernacular has made considerable progress in the colleges. It is generally assumed that the attitude of students toward their native speech in the secondary and in the lower schools should be practically constructive and not scientific or analytic, and consequently the historical study of the English language has not been introduced to any considerable extent in such schools. The work of the lower grades in grammar and composition (*q.v.*) is usually placed pedagogically under the head of language, but such "language work" obviously cannot attempt anything systematic or scientific.

The question of the content and the value of the historical study of the English language as part of a liberal education for English-speaking students is one that is frequently discussed and may be most conveniently considered from two points of view, first as to its practical usefulness, and secondly and more disinterestedly, as a subject of knowledge and reasonable curiosity that deserves to be cultivated for itself alone. The practical advantages to be derived from the historical and scientific study of the vernacular are mainly such as arise from the acquisition of a clearer understanding of the nature and the uses of language as a medium of communication, thus enabling the student to become more certain and confident in establishing the principles of his own use of language. The study of the changes which have taken place historically in the language, for example, is likely to beget in the student a more intelligent and less dogmatic attitude toward practical questions of the contemporary speech than is frequently found. He may thus be brought to realize that language at all times has been a social possession, flexible and made up of compromises, and that its forms have always been determined, not by external authority of any kind but immediately by the practical uses to which the language was to be put. In this way the fact of the speaker's or writer's own first-hand constructive power over language is brought home to him. Such a realization is at present particularly necessary and helpful for the American student, whose sense of reverence for the authority of the standard and classic language of literature has been developed at the expense of his own individual feeling for expressiveness by dogmatic instruction in rhetoric and composition. Since the historical study of the language acts usually not as a sedative but as an excitant upon the student, obviously the place for it is not in the early but in the later years of the college course. It would seem best to conduct such study in the college not in a detailed, systematic way as the science of language, but less technically by calling attention to particularly suggestive and illuminating examples of the way in which language reveals the activities of the mental life which lies back of it. Perhaps the most simple and effective avenue of approach to the study of language for the non-professional student is through etymology and the study of vocabulary in general. The study of phonetics is rendered unusually difficult for younger students because of their inability to objectify and observe their own speech sounds as distinguished from the arbitrary and inconsistent symbols of the English language; but the subject is one that cannot very well be neglected, and students should be trained at least to observe contemporary use and to understand the meaning of phonetics as applied to the explanation of etymological forms. It is perhaps easy for university-trained instructors to make the mistake of attempting too much in elementary linguistic courses, often doubtless from a feeling of the dignity and importance of the science of philology. But with all due reverence for the science of philology, one should realize that the college is hardly the place for scientific linguistics, and that the purpose of the instruction should be to extend the area of the student's interests and to shape his powers of linguistic observation rather than to present an organized science of the language. The discussions of contemporary, especially of divided, uses are particularly instructive, and the students may thus be led to form the habit of analyzing and passing judgment for himself on the linguistic facts which he observes.

A certain amount of the study of language is obviously necessary to the reading and appreciation of whole periods of English literature. The main question for decision here is, just how much training in language is necessary before a student may be said to be able to read Shakespeare or Chaucer or the literature of the periods before the Conquest. Opinions will doubtless vary, but it seems certainly a safe rule that the student should give as much attention to language as is necessary to enable him to understand the meaning of his author exactly. If early texts require what seems an excessive amount of preliminary linguistic preparation, they might better be omitted altogether than read carelessly and inexactly. The student who does not understand the syntax or the special meanings of words in Shakespeare, who misses three or four out of every ten words in Chaucer, and is never sure of his grammar, may blunder through the texts and come out at the end with some sense of enjoyment, and of exhilarated, even though confused, imagination; but he can never have any feeling of assurance that he has read his author aright. English literature as early as Shakespeare or earlier should not be read with the same attitude of mind toward its language as is maintained in reading Pope or Scott or Tennyson. If one wishes to treat with justice the language in which the earlier literature is written, one must assume a questioning attitude toward it, just as one does toward the social and literary traditions which the earlier literature records. In reading the literature of the Old English period the necessity of studying the language is so obvious that it cannot be avoided. It is chiefly in the intermediate period between Old and Modern English, when it is so easy for the careless reader to delude himself into the belief that he can get at the soul of an author without knowing how to define his words or to parse his grammar, that the understanding of literature is likely to suffer from the neglect of the study of language. The only safe rule is to examine every linguistic usage which differs from normal contemporary usage, and, if the burden of such examination is too great in any texts, to defer the reading of such texts until the student is ready to undertake them.

From the second point of view, the amount and the nature of the information with respect to the language which the well-informed student may reasonably be expected to have may be briefly summarized. The grouping of languages into families, which is one of the most important results of the comparative method of linguistic study, presents new and illuminating ideas to the student, and consequently English should be placed among its related languages and some consideration should be given to the general question of the origin and differentiation of dialects. Within the field of English specifically, the three great chronological divisions of Old, Middle, and Modern English should be distinguished, and the peculiar characteristics of each period, especially in sounds and inflections, may be profitably examined in detail. In connection with the study of sounds historically, it is extremely important that the student of the vernacular should receive training in the observation and analysis of contemporary sounds and vocal processes, both in his own speech and in that of others. It is only by persistent practice that the student can become truthfully and exactly observant of the actual phonetic character of speech, that he can, for example, distinguish the audible forms of English words, which are the vital and changing forms, from the visual forms, which in English are usually arbitrary and conventional. In the study of speech sounds, it is advisable, if not absolutely necessary, to make use of some approximately scientific method of sound notation, the most practical being a simple phonetic alphabet in which the symbols differ as little as possible from the standard alphabet, but in which no symbol has more than one value. Such an alphabet is employed in the indications of pronunciations in the *New English Dictionary*. The use of a phonetic alphabet will lead naturally to the consideration of the history of standard English orthography and of the principles which should govern the users of the language in their attitude toward spelling. The study of the English vocabulary may be approached from many different points of view; but so far as the history of the language is concerned, attention should be directed at least toward the various elements of which the vocabulary is composed, the sources whence these elements are derived, and the occasion and method of the introduction of borrowed words into the language. It is important that the student should understand the principles upon which the science of etymology is based as a corrective of the popular superficial method of etymologizing. The stylistic value and color of the elements of the vocabulary are matters mainly of rhetoric, but the study of the history of words leads over insensibly and unavoidably to a consideration of their values in use. Finally, the events in the history of the English people which have been important for the development of their language, for example, the Roman mission, the Danish invasions, the Norman Conquest, etc., will indicate the relation which exists between the life of the people and the growth of their language. In general the aim of an introductory course in the history of the English language should be to prepare the student, first, to use intelligently the material contained in the various handbooks, dictionaries, grammars, and other storehouses of information with respect to the language, and secondly, to observe with some degree of accuracy the facts of his own speech and of the speech of his environment. An intelligent understanding of the fluctuating material of the native speech cannot be obtained otherwise than by some such attention to the elementary facts of its history and use. G. P. K.

See English Usage; Literature; Philology; Phonetics.

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LANGUAGE, PSYCHOLOGY OF. — Any form of expression by means of which one individual conveys his own emotional or ideational states to some other individual may properly be called language. Thus the cries of the wild animal are very properly referred to under the term "animal language." Gestures have long been recognized as forms of language. The highly developed forms of oral speech and written communication which are characteristic of human beings are merely the final stages of a long evolutionary series of forms of social expression. The earlier writers upon language, not recognizing the relation between the highly developed forms of language and the more primitive forms of expression, devised various theories of the origin of language which assumed a sudden rise of this mode of expression. Thus, it was regarded as a special gift of God to man, as a mark of his superiority to all other animal forms.

Again, it was held that man through his power of imitation of natural sounds suddenly hit upon the device of using these sounds as a means of representing the external objects imitated. The cries of various animals, for example, were supposed to have been repeated whenever man wished to communicate with his fellows that the animal imitated was near at hand. These theories have been superseded in all later discussions by a more comprehensive account of the whole evolutionary series of forms of expression to which human language belongs.

The great work of Wilhelm Wundt, *Völkerpsychologie*, brought out the psychological importance of the study of language. In the first two volumes of this work, Wundt calls attention to the fact that language is nothing more or less than a highly evolved form of emotional expression. In the earliest stages of emotional expression the movements of the vocal cords are not to be distinguished from various other forms of emotional activity. Thus, the infant in distress makes noises exactly as he kicks with his legs and threshes about with his arms and hands. The facial contortions of the infant, including the movements of the organs of the mouth, are purely spontaneous and individualistic modes of behavior. All of these different types of behavior are familiar to the student of the emotions (*q.v.*).

The first stage of the evolution of language may therefore be described as the strictly individualistic and the emotional stage. A differentation begins to appear among emotional expressions as soon as the individual becomes a member of the social group. Certain of the emotional activities of such an individual are of special importance because they induce imitation in his fellows. Thus the facial expressions are of much greater social importance than the internal changes in the circulatory system. A person who is angry experiences a change in the rate of his heart beat, and at the same time shows a fixed contraction of the muscles of his hand and jaw. The expression of the face produces in those who are about the angry person either imitation or a definite protective reaction, while the inner change which takes place in the angry person's circulatory system passes wholly unobserved. This social significance of the observed reaction tends to raise it to the higher level. In the first place it is brought more or less under control by the individual himself, and in the second place it calls for a reply from other members of the social group. It becomes thus a medium for the transmission from individual to individual of emotional states.

The first types of communication are those which transmit purely emotional states. The frightened animal may induce a stampede in the other animals about him through mere social imitation. He cannot at this stage of development indicate in any way the ideas which are in his own mind. He may, however, communicate the emotional state of fear in all completeness. 2 The second stage of language is, therefore, to be described as the stage of emotional imitation. It is at this stage that most animals come to a standstill in the evolution of language. The frightened animal may indicate by its cry or action its internal emotional state, but it never produces a terminology which makes it possible to tell about the objects which it sees.

In human society, and possibly among the higher animals, there develops through expression the ability to communicate ideas as well as emotions. These ideas are at first very simple in character. Thus the hungry animal may go through the movements of taking food. Certainly among primitive human beings this mode of communication through pantomime is very common. The gestures that are involved in such communication through pantomime have been called natural signs. They are natural in the sense that they are partial activities of the type which the individual would perform if he were in the actual presence of the object which he wishes to depict. They are signs in the sense that they do not deal with the actual object, but merely recall the object to the two parties to the communication. Almost any simple human activity can be communicated in this way. Thus, the act of digging or throwing, the act of running or of looking toward some object in the distance, can be made to convey to another human being a very large fund of experience. Attention should be drawn to the fact that even the higher animals do not succeed in carrying this type of communication to any high stage. Indeed, it may be doubted whether they succeed at all except by the mere accidents of emotional expression such as was described in the last paragraph. At all events, such simple gestures as those of pointing are never developed in any conscious way among the animals, whereas, they appear in all races of men. 3 Natural signs, or primitive pantomimic gestures, may be distinguished from forms of emotional imitation as a third stage of language development.

There are certain disadvantages in the use of the hands for social expression. These disadvantages must have made themselves very early felt in primitive society. The use of gestures would interfere with any form of manual occupation. The use of the hands for expression would also be disadvantageous in any parley between enemies, for it would involve going out into the open, and also it would limit the ability to use weapons on the part of the person who was making an effort to communicate with others.

Finally, there is a fundamental fact of development which must have operated to limit the use of the hands for purposes of purely social expression. This fundamental fact appears in a natural tendency of the hand to develop a whole series of habits of movement which are not social in their character at all. The hand evolved in the direction of the manipulation of objects, and in so far as the various arts were cultivated, the hand must have been devoted more and more to forms of skill, and less and less to the incidental forms of emotional expression which are natural in earlier stages of development. This can be seen in the life of the infant. The hands gradually come to be specialized organs for seizing objects and holding them; and just in so far as the hands and arms are trained in the direction of manipulation of physical objects, they are less and less used for purposes of expression. The vocal cords, on the other hand, have no value as organs for the manipulation of external objects. They are very naturally utilized, therefore, as organs of emotional and social expression. They are sufficiently delicate in their musculature to make possible a great variety of acts, and they are under the control of the speaker to such an extent that they become admirable avenues for social expression. No physical medium is needed for oral expression except the air, which is always present; thus the vocal cords are superior to gestures for communication in the dark, and for parley between enemies and friends who are hidden from each other by intervening objects.

Such considerations as these indicate some of the reasons why in later human evolution the vocal expressions are selected from among the observable forms of behavior for the higher uses of human language. Oral expression is, however, not the exclusive means of these higher forms of expression, and we find not only the vocal apparatus, but also, though to a less extent, the hands, serving the purpose of the fourth stage of language development, to the description of which we may now turn.

The fourth stage of language development differs from the period of natural signs in that the signs which are employed at the higher level have less and less immediate connection with the situations to which they refer. The sign needs now only to symbolize in some manner the situation to which it relates. Thus we find in mature language that there is no traceable connection between many of the sounds which we employ and the objects to which they refer. Indeed, it is doubtful whether such a connection could be traced, even if we had the complete history of the word. One interesting illustration of the purely arbitrary character of language expression is found in the word "gas." This word was invented by the Belgian chemist, Van Helmont. He needed a word to express the state of matter which is denoted by this term, and so employed the term without any historical antecedents. In this example we have an admirable illustration of what is meant by the symbolical character of an expression. The vocal expression is connected in human experience with a certain idea. Once the connection between the sound and the idea has been made, the sound will in all future experiences tend to arouse the idea. There need be no natural connection between expression and idea, provided the connection has been established in some way, and has been commonly accepted. We may describe this stage of language development by saying that associational connections have been substituted for natural connections. Associational connections are frequently established between gestures and ideas as well as between sounds and ideas. Thus the deaf and dumb of our own generation have a symbol for the word "make" and all of its derivatives. This gesture consists in the crossing at the wrists of the two folded fists. It is enough for the purpose of human experience that there should be a connection between this gesture and the ideas. The gesture carries the ideas to any one who is trained in the interpretation of this symbol. It is obvious that associational language requires a high form of mental development; the individual must have a stock of ideas which can be related to the various forms of expression, and he must, in addition, have sufficient mental power to make it possible for him to hold the connection between the mode of expression and the idea.

For purposes of education, it is this final stage of language expression that is of importance. The child in the school finds it necessary to learn a vast body of ideas and the words which go with those ideas. Earlier stages of emotional expression are not of any very great importance in education, although the control of the facial expressions is undoubtedly one of the lessons that must be learned in all social groups.

After the associational stage of language has been reached, further processes of evolution go forward in the changes that take place in the meaning and character of words. Thus, there is a continual development of meanings. This is often illustrated in the English language, as is shown in Trench's *English Past and Present*. The word "villain," for example, which originally meant a laborer about a country place or villa, has gradually modified its meaning until it has the present well-known significance. Furthermore, the sounds of words undergo a change. The history of English shows very plainly, by the different rhymes which are employed at different stages of the development of the language, that there is a tendency for many sounds to grow shorter in their articulation. Qualitative changes also appear as languages evolve. The transition from German to English, or between any two languages, is accompanied by a very notable modification in the quality as well as in the length of the sounds involved. Thus, the German word *Tag* is the same in its origin as the English word *Day*.

More significant than these gradual changes in language is the fact that individual interpretations of words may differ to such an extent that the same sound may be related in two different experiences to wholly different meanings. The ambiguity of words has often been commented upon. Locke, in his *Essay on the Human Understanding*, discusses at great length the dangers that grow out of the ambiguous use of words, and this has been the subject of frequent comment on the part of educators since that time.

With the development of written symbols the means of human communication has been very greatly enlarged. Written symbols appeared much later than oral conventions. In the earliest stages of writing, there was the same tendency to use natural signs that we find in gesture language. The earliest written symbols were diagrammatic sketches of the objects which the writer would call to the mind of the reader. The diagrammatic sketch came to be very much simplified as the power of interpretation increased. Finally, in the occidental world, some Semitic nation, probably the Phœnicians, discovered the possibility of relating directly the written symbols to the sound elements of language. That there is no necessary intellectual connection between the elementary sounds and separate letters is well attested by the Chinese language, where the written symbol is related to the whole word rather than to the single sound. After the association of the written symbol with the single sound had been established, various changes appeared through the gradual modification of the sound connected with the letter, and through various modifications in the form of the letter itself. (See WRITING.)

Language instruction has always occupied a very important place in the schools. Since it is a highly evolved mode of expression, it requires laborious cultivation on the part of the child. Indeed, the school may be described as very largely an institution which introduces the child to this conventional mode of expression, and gives him the necessary meanings with which to interpret language. Reading and writing have, therefore, constituted a very large part of the elementary course of study. From time to time reformers have vigorously advocated a reduction of the amount of energy devoted in the school to the instruction in language; on the other hand, the tendency has often been to enlarge the emphasis upon language by the introduction of foreign languages as well as vernacular. C. H. J.

See Reading; Modern Languages.

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LANGUAGE, TEACHING AND STUDY OF. — See Grammar; Greek Language and Literature; Languages, Artificial; Language, English; Latin Language and Literature; Modern Languages in Education; Oriental Language and Literature, etc.; Reading, Teaching Beginners; Vernacular in Education.

LANGUAGE, USAGE IN. — See English Usage.

LANGUAGES, ARTIFICIAL. — The endeavor to fashion an artificial language has a long history, and has assumed many different forms. An imperfect kind of language which appeals only to the eye has been in practical use for half a century and more in the code of signals employed in naval and military communication. Still older are the attempts to construct a universal artificial language which could be both written or printed and spoken. Descartes in 1629 outlined a scheme for a universal, philosophical language. His plan was to establish a system "of all the thoughts which can enter into the human spirit," taking first the simple ideas, and combining these simple ideas in order to form the more complex ideas. Each simple idea was to have its appropriate character or symbol, like the primary numbers of the arithmetical system; and complexer and more limited ideas were to be expressed by combinations of these characters in such a way that the elements of a word would express mathematically its logical content. "The invention of this language," says Descartes, " is dependent upon a true philosophy, for it is impossible otherwise to indicate all the thoughts of the human mind, or to put them in order, or even to distinguish them in such a way that they shall be clear and simple. . . . If the primary ideas which are in the human imagination and of which all things that men think are composed, were thus set forth and generally accepted, I would venture to hope for a universal language easy to learn, to pronounce, and to write, and, most important of all, one which should aid the judgment, presenting to it so distinctly all things that it would be almost impossible for it to deceive itself. . . . With the aid of such a language, a rude rustic could better judge of the truth of things than the philosopher can now do."

This theory of Descartes is at the base of a great many attempts to construct a universal philosophical language. It supposes first a systematic program of all logical ideas, classified under general heads with sub-classifications leading to the particular and concrete, and second a set of symbols, numerical or literal, chosen arbitrarily to designate these ideas. The result would be a kind of algebra of language, the meaning of every combination of symbols being absolutely fixed by its place in the philosophical system. Descartes himself never worked out his theory into a practical form, but this was done by others. George Dalgarno, a Scotchman, published in 1661 his *Ars Signorum,* a universal and philosophical language, followed in 1668 by Bishop Wilkins' *Essay towards a Real Character and a Philosophical Language,* in which the vocabulary is based upon forty logical categories, supposed to be exhaustive of all general and primary ideas. Leibnitz (*q.v.*) carried further the methods of Dalgarno and Wilkins, against whom he directed the reproach that they were not sufficiently philosophical. Leibnitz drew a close parallel between mathematical and logical processes. Every thought having, as he maintained, as fixed a character as a number, the primary ideas may be designated by primary numbers, and all complex ideas merely as combinations of primary ideas. The combinations of ideas are thus supposed to be analogous to multiplication in arithmetic. They may be expressed by numbers, and the problem of a universal language consists simply in transforming the mathematical formulas into words that may be pronounced. In carrying out this seemingly simple plan, Leibnitz, in common with all the other inventors of philosophical languages, makes use of a system extraordinarily complicated when one looks at it from the point of view of the practical user of language. But it is apparent that the advocates of an artificial philosophical language have paid little heed to questions of practical use. They have been concerned primarily with the attempt to systematize and then to symbolize all logical ideas, and the discredit which has in general fallen upon the program methods of systematic logic has deprived their efforts of both scientific and practical interest to the modern student of language.

An entirely different point of view is usually assumed by modern theorists in the construction of artificial languages. Instead of a universal philosophical language, they generally advocate an auxiliary international language. The purpose of such a language they assume to be to supplement the mother tongues of the various countries in order to make international scientific and commercial communication easier by the use of one arbitrarily selected language in the place of the present variety of local and national speeches. They assume further that no national idiom, either a dead language like Latin, or a living language like English or French, has any chance of being accepted by a sufficient number of the nations concerned to answer the purposes of an international speech. It is not supposed, except by extreme theorists, that a single artificial language of this practical character will ever supplant native idioms in the familiar intercourse of daily life. The principal aim of these advocates of artificial languages is not "the federation of man" through the imposition of one speech upon all peoples, but the strictly utilitarian end of greater ease of intercommunication. It is apparent that such a language in any case must appeal to a relatively limited number of people, mainly to travelers and to those interested in international science and commerce. It is also apparent that the need of an international auxiliary language is greater in Europe than it is in America, and that the people of relatively small countries like Denmark, or of countries which use a language difficult to learn and not generally known, like Russian and Hungarian, will profit more by an auxiliary language than will the people of Germany, France, or England. But the great advantage of such a language to all nations cannot be denied; and the main difficulty to be met is not a theoretical one, but the practical difficulty of getting one language generally accepted.

The first important experiment of recent years in the manufacture of an artificial language was that of Schleyer, who called his language Volapük. A Roman Catholic priest, Schleyer perhaps felt in an especial way the need of an international medium of communication. The year 1879 is given as the date of Schleyer's discovery, or invention, of this language, of which he wrote a grammar that has passed through a number of editions. The language employs the Roman alphabet, and bases its vocabulary mainly upon English, because English is the language of the largest number of people who might be supposed to be interested in an artificial language. But inasmuch as the sounds of Volapük are not the sounds of the English letters, even an English-speaking person would find it difficult to understand the spoken form of a word in Volapük. As to the grammatical system, Schleyer invents more or less arbitrary inflectional elements to indicate case and tense relations, the parts of speech, etc. He also accepts other arbitrary rules; for example, he excludes the sound and the letter *h* altogether, and to a large extent the letter *r*, since the Chinese find this latter sound difficult to pronounce. Since no word, according to his rules, can end in a spirant, the English-Romance word *rose* becomes *lol* in Volapük. To avoid the final spirant, the English *sooth* becomes *tut;* English *program* becomes *plogam.* And since every root must end in a single consonant, English *friend* becomes *flen.* As far as possible, roots must also be monosyllabic, and Schleyer therefore removes initial and final unstressed syllables, with the result that *compliment* becomes *plin*, French *remarquable* becomes *makab.* These few illustrations will indicate the main defect of Volapük. Although it purports to be based mainly upon the most familiar of European languages, English, French, German, and Latin, the forms of the words are so altered that they cease to be recognizable. Schleyer's method throughout is extremely arbitrary, and though Volapük is an advance over the older philosophical languages, it develops its relatively sound basic principles in a very uneconomical and unsatisfactory manner. Moreover, in attempting to make his language universal, for example, in introducing modifications with reference to the Chinese, Schleyer has exceeded the limits of practicability. An international European language is a sufficiently difficult achievement, and Schleyer has to a considerable extent sacrificed usefulness to a vain longing for universality. Finally, Schleyer was not sufficiently systematic in establishing his principles and in adhering to them, with the result that his language is often as arbitrary and as exceptional as are the natural idioms.

Perhaps the greatest service of Volapük to the study of artificial languages was the demonstration it gave of the practicability of such a language. It was followed by numerous other experiments, most of them very short-lived. An important advance was not made until the appearance of *Esperanto* in 1887. This language was the invention of a Russian physician, Dr. Zamenhof, whose youth was passed in a village in which four different and antagonistic languages were spoken, Russian, Polish, German, and Hebrew. As a schoolboy Dr. Zamenhof was stirred by the ideal of an inter-language, and Esperanto, as it finally appeared, was largely the outcome of these early humanitarian impulses. The interest in Esperanto at first spread slowly, but enthusiasts gradually gathered in support of it, and it soon came to have more adherents and students than any artificial language before it had acquired. To-day it shares with its successor and rival, *Ido*, or the Idiom Neutral, the place of eminence among artificial languages.

So far as its grammar is concerned, the ruling principles of Esperanto are simplicity and regularity. The alphabet consists of twenty-seven letters, five vowels, and twenty-two consonants, each of which has a constant and single value, the vowels being given what is known as their Continental or Italian pronunciation. Esperanto is thus phonetically regular. The symbols used are the familiar ones of the Roman alphabet, but five consonant symbols are used twice, with the awkward device of diacritical marks placed over the respective letters to indicate their special values. Thus *g* = the sound in "good," *ĝ* = the sound in "gem." The accent of words is fixed, and falls always on the penultimate syllable. Specific endings indicate the various parts of speech: substantives always end in *-o*, adjectives in *-a*, derivative adverbs, *i.e.* those derived from words which appear also as nouns and adjectives, in *-e*. The definite article is *la;* it is indeclinable, but the syntactical rules for its use are somewhat complicated. The language has no indefinite article, the indefinite idea being assumed from the lack of definition.

Nouns are inflected for the plural number by adding *-j* (= *-y*) to the singular, and for the accusative case by adding *-n* to the singular or plural form of the nominative. Adjectives are inflected like nouns. The nominative singular, therefore, of the phrase "the good father" would be *la bona patro*, the accusative *la bonan patron.* The plurals, nominative and accusative, would be *la bonaj patroj*, and *la bonajn patrojn*, the adjective agreeing with the noun in inflection. Comparison of adjectives is expressed analytically by means of separate words of comparison, like English *more*, *most*.

The personal pronouns are *Mi*, I; *Vi*, thou, you; *Li*, he; *Si* (pronounced like English *she*), she; *Gi* (*g* soft as in *gem*) it; *Ni*, we; *Ili*, they. The indefinite "one," German "man," is *oni*, and the reflective pronouns for all genders and numbers is *si*. The accusatives of all these pronouns are formed as in the nouns by adding *-n*. Possessive pronouns are formed from the personals by making them adjectives, that is, by adding *-a*.

There is only one conjugation for the verb in Esperanto, which is therefore completely regular. Inflections are used to indicate tense and mood, person and number being expressed only by the subject of the verb. The inflection of the infinitive is *-i*, *ami* = to love; of the present tense, all persons and numbers, *-as*, *Mi amas* = I love, *Ili amas* = they love; of the past tense, *-is*, *Vi amis* = you loved, *Li amis* = he loved; of the future, *-os*, *Mi amos* = I shall love, *Li amos* = he will love; of the conditional mood of verbs, *-us*, *Mi amus* = I should or would love; of the imperative, also of the subjunctive, *-u*, *Amu* = Love, *Li finu* = Let him finish, *ke mi amu* = that I may love. Three participial forms, *-anta*, ·present, *-inta*, past, and *-onta*, future, are used for the participles of the active voice, which can be used as nouns, adjectives, or adverbs by taking the proper endings. There are also three passive participles, *-ata*, *-ita*, *-ota*, subject to the same rules as the active participle. These participles are used in the formation of verb phrases like those of English grammar.

Prepositions are followed by the nominative and not the accusative case. Adverbs, prepositions, and conjunctions, *i.e.* the particles in general, are less reducible to simple type forms than the other parts of speech, and consequently this part of Esperanto grammar is likely to seem more difficult and artificial than the rest. Many of the forms also seem strange, *e.g. krom*, except, without; *kial*, why; *kiam*, when; *tial*, therefore, etc. The word order of Esperanto is logical, and very similar to that of modern English.

In its vocabulary Esperanto is based upon a relatively small number of root words, chosen according to the sound principle of the maximum of internationality. A first group of words is made up of roots which are of the highest degree of internationality among the European people, *e.g. atom*, *aksiom*, *form*, *flut*, *fosfer*, *teatr*, *tabak*, etc. (in the spelling of Esperanto). Another group consists of those which are only partially international, but which are chosen for their places in the international language because they are used by the larger number of European languages. By a similar process of selection the whole vocabulary is thus built up on this principle of the maximum of familiarity or internationality. It should be observed, however, that this root vocabulary is not concerned with questions of etymological origins in the various national speeches. Thus the English language is assumed to possess the root word *vir-*, "man," because it has the adjective "virile." The guiding principle in the selection of the roots has been their intelligibility, not their etymological history. Besides its vocabulary of international roots and its inflectional system, Esperanto also makes use of composition or agglutination in the formation of words. Thus the prefix *mal-* indicates *the contrary* or *opposite*, *e.g. amiko*, "friend," *malamiko* "enemy"; the suffix *-in* indicates the feminine, *e.g. viro*, "man," *virino*, "woman," *patro*, "father," *patrino*, "mother"; *-et* indicates the diminutive, *e.g. monto*, "mountain," *monteto*, "hill," etc.

Esperanto has suffered the usual fate of artificial languages in that it has had to meet with the opposition of a rival language, in this case *Ido*, or Idiom Neutral. Ido was promulgated by the *Delegitaro por Adopto di Helpanto Linguo Internaciona* (Delegation for the

Adoption of an International Auxiliary Language). This Delegation resulted from the Paris Exposition of 1900, and was self-constituted, its purpose being to decide which of the various international languages should be generally accepted as the standard one. Endeavors were made to have the International Association of Academies assume the responsibility of deciding this question, but this organization refused to do so by a vote of twelve to eight. The Delegation then constituted a committee of twelve, which met in 1907, with the distinguished scientist, Professor Ostwald of Leipzig, in the chair. This committee unanimously decided that the best language was a modification of Esperanto, presented by M. de Beaufront and known as *Ido.* Overtures were made to the *Lingua Komitato* (Linguistic Committee) of the Esperantists, looking toward the coöperation of the advocates of Esperanto and Ido. The Esperantists, however, refused to join forces with the Delegation, and Ido consequently now presents itself as an independent claimant for recognition as an international auxiliary language.

Accepting in general the principles of Esperanto, Ido differs from it only in details which its supporters regard as improvements suggested by experience. For example, Ido does away with the diacritical marks of the Esperanto alphabet, and uses only the twenty-six symbols of the English alphabet. It likewise dispenses with the accusative case of Esperanto, on the ground that case is sufficiently indicated by word order, as in the English language, which has no case forms except a few survivals in the system of the personal pronoun. It further advocates a number of modifications and extensions of the vocabulary of Esperanto. In general the reforms of Ido may be regarded as carrying to a higher degree of simplicity and effectiveness the principles of Esperanto.

Several questions suggest themselves as to the future of international auxiliary languages. It seems at present impossible to say which one, if any, of the languages now competing for the honor will be generally accepted. On the other hand, there seems little reason to doubt that in course of time some one international language will meet with general acceptance and will be used for the purposes to which such a language can be put. Some of the best linguistic thought of modern times has been expended on the subject, and the improvement of such a language as Ido, for example, as compared with Volapük, has been very great. An artificial language, being the result of human theory and ingenuity, must necessarily perfect itself gradually, and the reproach of impermanence which is frequently made against all such projects may as justly be urged against international arbitration, or peace, or any other formative idea.

G. P. K.

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LANGUAGES, MODERN IN THE PRIMARY GRADES. — See Modern Languages in Education.

LANTERN IN THE SCHOOL. — See Visual Aids to Teaching.

LAOS. — See France, Education in the Colonies of.

LA PLATA UNIVERSITY. — See Argentine Republic, Education in the.

LAPSES. — Inappropriate responses to a given situation, especially in speaking and writing, and occurring in that condition of attention known as absent-mindedness. If attention is regarded as the focal point of consciousness, the lapse may be considered as due to the relationship between the focal point and the margin. Proper adjustment to environment requires not only concentration of consciousness at one point, but a proper relating of the marginal elements. If this is not the case, the result is absent-mindedness. Absent-mindedness may be due to two quite different phases of the attention process. In the first place, the attention may be so concentrated at one point as to neglect to too great an extent the marginal elements (abstraction). In the second place, the absent-mindedness may be due to too little concentration, that is, dividing of the attention (distraction).

In speaking and writing we carry on a number of more or less separated activities at the same time, the attention usually being occupied with the thought of expression, and the expression itself being cared for by the more or less automatic processes controlled by the marginal elements of consciousness. Frequently, when the attention is concentrated or distracted, these two processes interfere with each other, and lapses result. An example is frequently to be found in the schoolroom, when the teacher, in asking a question, inadvertently gives the answer to the question. It is to be noted that the person making the error is frequently unaware of the fact, and never aware of it until after it has occurred. It is the result of involuntary processes, due to the causes mentioned above. Fatigue, hurry, and nervousness often are inducing causes of lapses, and some persons are much more inclined to make them than others. Lapses have interesting similarities to the phenomena found in aphasia (*q.v.*). E. H. C.

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LARABEE, BENJAMIN (1801 - 1883). — Fourth president of Middlebury College; he graduated from Dartmouth College in 1828 and the Andover Theological Seminary in 1831. He was principal of a manual training school at Springfield, Tenn.; professor and president of Jackson College, Columbia, Tenn.; and president of Middlebury College (1840–1866). From 1871 to 1876 he was lecturer at Dartmouth. W. S. M.

LASALLE COLLEGE, PHILADELPHIA, PA. — See CHRISTIAN BROTHERS.

LASALLE, ST. JOHN BAPTIST DE (1651 - 1719). — Founder of the Institute of the Christian Brothers (*q.v.*). Born of a noble family at Rheims, he early showed a highly spiritual and devotional temperament, and at the age of eleven received the tonsure. In 1667 he was installed Canon of the Cathedral at Rheims. He studied at the local university, and took his M.A. in 1669, and then proceeded to the Seminary of Saint Sulpice in Paris, where he also attended lectures at the Sorbonne. The students at the seminary were required to help the director in catechizing a large number of children, and the questions of method were frequently discussed. In 1678 Lasalle entered the priesthood. Inspired by the enthusiasm of his spiritual director, Nicolas Roland, he succeeded him in the general supervision of the Congregation of the Sisters of the Child Jesus, which conducted a free school for girls, although on his own confession he was not greatly interested in education. It was almost by chance that he undertook the great educational work which gives him an important place in the history of education. A relative living in Rouen requested him to assist in the opening of a free school in Rheims, of which Adrien Nyel was the master. The success of this school led to the foundation of others, until there were five masters in the town. Lasalle soon discovered that in spite of himself he must take an interest in the welfare of these men, and, acting at first as their adviser, he decided before long to resign his canonry and his worldly possessions and live with them. In 1681 a house was purchased, and the foundation for the Institute of Christian Brothers was laid. A rule was drawn up, which was the basis of the later rule; new teachers joined the community, and the demand for the *Frères des Écoles Chrétiennes* rapidly increased. Unable to satisfy any requests but those from towns, he undertook to train boys who were sent to him by the country clergy and who were to return to their homes after their period of training. A novitiate had already been instituted, more by accident than by design. In 1688 Lasalle accepted a call to Paris; in 1691 a house was rented at Vaurigard, near Paris; and in 1693 the Rule was drawn up as now known. In 1695 the *Manual* was issued. Christian Brothers were requested to take charge of the schools of several parishes. The work of Lasalle himself, however, was not confined to the elementary schools. He personally took charge of a Sunday school for young artisans under twenty, and taught them mathematics, mechanics, drawing, and other vocational subjects. After the English Revolution (1689) he was requested by Louis XIV to take charge of a number of Irish and English Catholic boys of good families. But the extension of his work in Paris brought him into conflict with the established order of writing masters and schoolmasters, and as a result of a lawsuit, he was forbidden to open schools in Paris without the permission of the Precentor (1705). Further, he was not immune from ecclesiastical jealousy, and attempts were made to remove him from his position as Superior of the Brothers. In 1705 he opened at St. Yon another house, which was destined to become the mother house of the Institute. In 1712–1714 he traveled in the south of France, visiting the houses of the Christian Brothers and novices. In 1716 he resigned as Superior, and was succeeded by Brother Barthélemy. In 1719 he died at Rouen.

On French education Lasalle and his Institute exercised the greatest influence in introducing a better class of teachers and a better conception of schools and instruction. How far his influence went outside of France it is impossible to say, but many of his reforms in education were certainly reintroduced or rediscovered later. For a detailed account of his educational work and theory, and a list of his writings, see CHRISTIAN BROTHERS and the references there given.

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LASCARIS, CONSTANTINE (1434–1501.) — A Greek teacher of the Renaissance period. He belonged to a noble family, and until its capture by the Turks lived in Constantinople, afterwards finding a refuge in Corfu and Italy. He was Greek tutor to the daughter of Francesco Sforza at Milan; taught at Rome with the support of Cardinal Bessarion; and in Naples at the request of Ferdinand I. For a time he was also in Spain. The last thirty-five years of his life he spent as a teacher of Greek at Messina, where he numbered the future Cardinal Bembo (*q.v.*) among his pupils. His chief work was the *Grammatica Græca sive Compendium octo Orationes Partium* (1476), probably the first Greek work known to have been printed. This *Grammar* was much used in schools. Lascaris also collected and copied many Mss. His collection, which was left to the Senate of Messina, was placed in 1712 in the National Library in Madrid.

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LATERAL CURVATURE. — See SPINAL CURVATURE.

LATHROP, JOHN HIRAM (1799–1866). — First president of the University of Missouri. He graduated from Yale in 1819, and taught school in New England for several years. He was professor in Hamilton College (1828 - 1840); president of the University of Missouri (1840 - 1849 and 1865 - 1866); president of the University of Wisconsin (1849 - 1859); president of the University of Indiana (1859 - 1860), and professor in the University of Missouri (1860 - 1866).

W. S. M.

LATIN LANGUAGE AND LITERATURE, IN EDUCATION. — Historical. — The history of Latin in the schools is practically the history of schools, at least of all schools above the most elementary character, from the closing centuries of the Middle Ages until well into the nineteenth century. The secondary school was the dominant school throughout all this period and in almost all cases they were Latin schools. To such an extent was this true that the terms by which they were known, Grammar Schools, Public Schools, Free Schools, Gymnasien, Lycées, Colleges, were practically all synonymous with Latin School. Until the nineteenth century Latin was practically the only subject; that is, all other subjects were studied incidentally and through the medium of the Latin language and literature. Greek might be added; and in some cases in the eighteenth, and quite generally in the nineteenth century, mathematics. Hence the historical aspect of Latin in the schools is treated at length in various articles. The entire scope of the subject is included in the article on GRAMMAR SCHOOLS. The articles on GYMNASIUM and LYCÉES give other aspects of this subject, as do also in a less direct way those on ACADEMY, COLLEGE, and UNIVERSITY. The article on the RENAISSANCE AND EDUCATION treats of the formulation of the secondary school as it was given the Latin form in which it has dominated throughout the modern period; that on education during the Middle Ages, its place and function in the earlier period. For a detailed statement of the place of Latin language and literature in the educational systems of the nineteenth century, see the sections on Secondary Education in the various articles on the national systems given under the caption of each nation.

The following sections relate to the development of the school material connected with the subject, and the scope and method of the subject in the present.

Latin-speaking. — As ancient Rome had endeavored to establish a universal Empire, so the medieval ecclesiastics attempted to organize a universal Church, within which there should be the uniformity of dogma, of Church ritual, and along with it uniformity of language in which divine service should be conducted, viz. Latin. With the various dialects into which the Latin was broken up in Spain, France, Italy — there was only one standard to which appeal could be made for intelligibility, viz. the ancient Latin, as contained either in classical authors, in the Vulgate copy of the Scriptures, or in the tradition of spoken Latin, mainly if not entirely centered in the ecclesiastics. When the new enthusiasm of the Renaissance came, with the fresher knowledge of Latin and Greek authors, the need of the Latin speech as felt in the medieval period was emphasized, the real change being the recognition of the necessity to substitute classical Ciceronian language for the old monkish jargon and barbarism which had been developed in the long course of medievalism. So, in 1516, when Bishop Fox founded Corpus Christi College, Oxford, by statute, he required his first lecturer, "the sower and planter of the Latin tongue, to manfully root out barbarity from our garden, and cast it forth should it at any time germinate therein." Besides reading classical authors, Bishop Fox directed his lecturer to read to all who wished to hear him the *Elegantiæ* of the Latin Tongue, by Laurentius Valla, who had described Latin as the "sacristy of erudition." He had embodied the opinion of all the scholars when he said that since Latin is the treasury of learning and the instrument of conversation, it should be the *one language* in common use amongst all nations. It was clear that all Christians initiated in the same religious duties must use it. It was often pointed out that the diversity of languages was due to sin, and the return to a unity in language seemed therefore to have a certain religious implication. There would be a confusion of all kinds of knowledge if different languages were used, owing to men's ignorance of many languages. The enthusiasm of the Renaissance led to the ubiquity of students, and Latin followed in their train. Thus it is said that hotel keepers and merchants had to adapt themselves to some sort of Latin speaking and beggars moaned out Latin tags in their appeals to student passers-by.

In the earliest statutes (1274) of an Oxford college, viz. Merton College, it is laid down for scholars " when they speak they must use the Latin language," and in its use defer to the direction and correction of the grammar master. In Queen's College, Oxford (Statutes, 1341), scholars had the choice at table of Latin or French, and only out of politeness to a visitor were they to speak the vernacular. In 1556, Trinity College, Oxford, made the requirement that all public conversation, especially amongst scholars, was to be in " a learned tongue." It may be mentioned that about 1705, when Dr. Woodroffe proposed that Gloucester Hall (afterwards Worcester College) should become a specially Greek College, the requirement was suggested that for two years students should converse in ancient Greek and then learn Latin and Hebrew. Similarly, at Cambridge colleges, Latin was required as the language of conversation, until the great Civil War. Wordsworth (*Scholæ Academicæ*, p. 90) points out that though Latin ceased to be used conversationally in college halls, yet it continued to be used as the language of college lectures, disputations, and on official occasions. He further states that Adam Smith was the first to lecture in English at Glasgow University, though it seems probable that Dr. Hutchison had done this in 1727. The registers and annals of the College of Physicians were kept in Latin up to the end of the seventeenth century. Physicians made Latin notes of cases, and still prescriptions in England show marked traces of the old Latinity in dealing with the pharmacopiæ. The annual Harveian oration in the College of Physicians of England was given in Latin till 1865. As recently as 1874 the retiring proctor at Cambridge gave his speech in Latin. And still, on public occasions, the public orator in the English universities gives his speeches at presentations for honorary degrees in Latin. Fulbecke, in the *Preparative to the Study of Law* (1600) and Doderidge in his *English Lawyer* (1631) expect the lawyer to have ability in Latin "clear and neat style," and to avoid barbarisms. James Whitlocke, a judge on circuit, going to Chester, was met at Whitchurch by many gentlemen of Shropshire and Cheshire, and had a Latin oration made to him at the marketplace. The Council of Trent in 1562 required that preaching should be in the vernacular, which points to a survival of a previous practice of preaching in Latin. In 1564, when Queen Elizabeth visited Cambridge, Dr. Perne preached a Latin sermon before her in King's College Chapel. M. Massebieau quotes from M. Haureau to show that sermons in Latin were frequent, abroad. Such a statement does not hold of England except in university sermons and sermons *ad Clerum.* Candidates for the degree of B.D. in the University of Cambridge were required to preach once in Latin and once in English at St. Mary's Church (George Peacock, *On the Statutes of Cambridge*, p. 12). In 1635 Cornelius Burges preached to his fellow Puritan ministers of London in Latin. William Bedell, while at Venice (1607–1610) as chaplain to Sir Henry Wotton, wrote his sermons in Italian and in Latin. Previously, in the time of the Marian Persecution (1553–1558) the chief English exiles in Strassburg, Frankfort, and Geneva spoke with foreigners mainly in Latin.

Ambassadors ordinarily spoke Latin, but in 1659 John Pell spoke Latin to a burgomaster, who told him he had given over speaking Latin "these fifty years," though in 1660 Edward Leigh in his *Advice on Travel* states spoken Latin to be a necessary part of the equipment for the Grand Tour of travel. (See *Cambridge History of English Literature*, Vol. VII, p. 314.)

When the Nonconformist Academies (*q.v.*) were established, lectures were given in Latin, and it is said that Dr. Doddridge was the first to introduce the use of English for the regular lectures in 1730.

. But quite outside of the higher institutions of learning, Latin speaking must have been common in medieval and Renaissance times. As Mr. Leach says with regard to pre-Reformation knowledge of Latin: " The diplomatist, the lawyer, the civil servant, the physician, the naturalist, the philosopher, wrote, read, and to a large extent spoke, and perhaps, thought, in Latin." He suggests further that Latin was used by merchants, the bailiffs of manors, town and gild clerks, generals, travelers, architects, all of whom needed a knowledge of Latin as a spoken as well as written language. In other words, before the Reformation England was to a large extent bilingual; every educated man, as it has been said, " knew something of the language in which he said his prayers." The one profession was the Church. This was the democratic outlet, for advance in a Church career was a poor boy's chance, whether he was to become a diplomat, a lawyer, or even a physician. Boys were brought up in the chantry of a church, *i.e.* within the church building itself, and breathed the atmosphere of Latin. The Renaissance intensified the importance of Latin for children, but insisted on pure Latin instead of the medieval barbarism. Erasmus, Vives, Sir Thomas Elyot, regarded Latin as the one language by which a child could become well instructed both in literature and all sciences. (See Sir Elyot's *Governour*, Croft's Edition, Vol. I, pp. 33, 54, 116.) The child should be surrounded by parents, tutors, servants, all of whom should speak to him only in Latin. For an instance of such family training see Corderius' *Colloquies* (Bk. II, *Colloquy* 50), said to refer to the household of Robert Stephanus, and the well-known case of Montaigne. Latin speaking became at any rate the mark of a gentleman's training, and important for all who contemplated foreign travel. There is the extraordinary case of Robert Gentili (1590–1654), son of the famous Perugian lawyer Alberico Gentili, educated in England. He always spoke to his father in Latin, and his mother in French, and at seven years of age it is said he could speak both languages as well as English. But his after career did not add credit to the educational prodigy.

The Reformation made Latin speaking less important for the ordinary child, because services took place in the vernacular. But for the educated and for the intelligent Protestant, Latin speaking was still essential, for those who read Calvinistic foreign writers, and wished to be in touch with foreign thought. The Exile-Reformers were permeated with the educational views of coreligionists abroad, and the leaders in the reign of Elizabeth introduced the requirement of Latin speaking into the school statutes. In the writer's *Grammar Schools up to 1660* (pp. 316 *et seq.*) are given representative instances of the requirement of Latin speaking in the statutes of English grammar schools from 1524 to 1664.

In Malim's *Consuetudinarium* for Eton College in 1560 a boy was to be named as a *custos* if he was detected talking English in lesson time and for other school lapses. The name was originally given to the boy in each form who had to repeat the lessons first and to answer questions, and it is suggested by Maxwell-Lyte that it came from medieval times by analogy to the *custos chori*, whose duty was to begin the singing in church — as the school *custos* was to begin the repetition in school. In 1621–1628 the *Consuetudinarium* of Westminster School required monitors, "Two for the Hall, and as many for the Church, the School, the fields, the cloister; which last attended them to the washing and were called *Monitores immundorii*. The captain of the school was over all these, and was named *Monitor Monitorum*. These monitors kept boys strictly to the speaking of Latin in their several commands," it was their duty to present "complaints or accusations" every Friday morning. At Houghton-le-Spring (1574) the boys thus appointed were called *Impositors*, and held duty from Friday to Friday. Custodes, Monitors, and Impositors, as checks on lapses into English speaking, became a frequent institution in schools, and within the memory of those still living there were similar checks against speaking Welsh instead of English in some Welsh schools.

As to the method of training in the speaking of Latin, John Brinsley (*q.v.*) devotes Chapter XIX of the *Ludus Literarius* (1612) to a detailed statement. The criticism there made of Latin speaking in the schools is not that it is not attempted, but that the boys speak "in barbarous phrase," and do not "utter their minds in Latin easily, purely, and freely." Brinsley objects to the ordinary school practice that Latin speaking should not be delayed, for fear of barbarisms, till the third, fourth, or fifth forms, but should be begun from the first entrance into "construction." The first Latin reading books and authors should be chosen for the purpose of teaching correct Latin speaking. Hence the employment in the school of the *Confabulatiunculæ pueriles or Children's* (Latin) *Talk*, and the Colloquies of Corderius (see Colloquies). Children "should then begin to practice to use those phrases which they there learn." Brinsley further notes that the reason the Latin grammar is written in Latin and not in English is "only or chiefly to train up scholars to *Deliver* all their Grammar rules and matters concerning Grammar, in Latin." . The methods to be employed in teaching Latin speaking are given in full by Brinsley. All examination of grammar rules and reading of authors should be questioned out closely and answered at first in both English and in Latin, until the pupils can answer in Latin alone. What the pupil is unable to answer in Latin, "utter you ever before them; that as the child learneth of the mother or of the nurse to begin to speak, so they may of you and of their author," in Latin. The daily use of the reading of dialogues out of English into Latin, "is nothing but such talking," and may be supplemented by the master "speaking in Latin easily and purely even in ordinary matters." For from the dialogues — like those of *Confabulatiunculæ pueriles* and Corderius, children can speak not only of what is there included but also form talk modeled on them for themselves. In parsing the dialogues, *i.e.* construing and parsing them, they should further "talk" them, uttering every sentence *pathetically*, to one another, first in English, then in Latin. The early stages of Latin speaking thus acquired, Brinsley requires class work in parsing, etc., questions and answers to be in Latin by teacher and pupil; other exercises are grammatical disputations, use of variety of phrases, and further and harder dialogues. But "warrantable and pure phrase," in which lies the solution of Latin-speaking, consists in "practice in a good way," and Brinsley adds, "as in all the rest, is that which doth all."

One of the projects of the seventeenth century in connection with training in Latin speaking was described by Eilhardus Lubinus in 1614 as the setting up in each country of a *Cœnobium*, or Community, in which there should be those who had the pure Latin accent and speech, and who should be attended by servants and attendants, even kitchen scullions, who also spoke pure Latin, so that pupils could go and learn no less quickly and perhaps no less certainly than formerly in the Forum Romanum. By residence in such a colony for two or three years, sound Latinists might be produced, Lubinus thought, "profitable to mankind and in it to the distressed Church of God." Lubinus's views were translated into English, and published by Samuel Hartlib in his *True and Readie Way to Learne the Latine Tongue* (1654). One of the Sloane Mss. in the British Museum Library contains a letter of Thomas Horne, written to Samuel Hartlib in 1652. Horne suggests that the charges commonly bestowed on public schools should rather be laid out for the planting of Roman, Grecian, and Hebrew colonies. And Latin-speaking foreigners should be brought to England, Polonians, Germans, French, Spaniards, Italians, "who speak Latin well and must be induced to speak no other."

Abroad, Latin was spoken, as Alfred Franklin says: "Le Latin était la seule langue reçue 'au pays Latin,'" and he quotes a letter of Gui Patin, of May 24, 1650, in which the writer says: "J'ai été aujourd'hui au pays latin, qui est l'Université."

Another description of the training in Latin speaking may be found in Hoole's *New Discovery of the Old Art of Teaching School* (1660). Latin speaking as a school training gradually declined after the commonwealth period in England, though J. T. Phillipps urged enthusiastically more Latin speaking and less grammar teaching in his *Compendious Way of Teaching Ancient and Modern Languages* (1727).

There is now a tendency to return to the direct method of teaching Latin, and, at least to some degree, of Latin speaking. One of the best expositions of the latest English methods in this direction is Dr. W. H. D. Rouse's *Latin and Greek*, Section VII of Professor J. W. Adamson's *Practice of Instruction* (London, National Society's Depository, 1907).

F. W.

Latin Grammars, Vocabularies, and Teaching Apparatus. — *Dictionaries.* — Vocabularies with the English as well as the Latin were an earlier form of teaching equipment in England than the grammar. A collection of vocabularies, word glosses, and glossaries from Mss. extending from the eighth to the fifteenth centuries was made by Thomas Wright and privately printed in 1857. In 1884 this collection was reëdited and published by R. P. Wülcker. Among the vocabularies thus brought to light by Wright are Alexander Neckam's Treatise *De Utensilibus* of the twelfth century and the *Dictionarius* of John de Garlande of the thirteenth century. Neckam's book consists of Latin terms for all the ordinary avocations and occupations of men and women, with a continuous interlinear gloss of explanations in easier Latin, in French, and in English. It is conjectured that the explanations were for the use of the schoolmasters, whose Latin knowledge might need support and suggestion. The vocabularies with their words grouped round subjects instead of being arranged alphabetically, were rather lesson books than dictionaries in the modern sense. John de Garlande's *Dictionarius* gives the Latin names for parts of the body, and for trades and manufactures. He then described the house of a Parisian citizen and its furniture, his own wardrobe, the Church and its priest, and various other occupations. Dean Nowell, in the Statutes for Bangor Friar School, in 1568, describes the method for use of vocabularies, which probably had gone on for centuries previously. "The schoolmasters shall every night teach their scholars their Latin words with their English significations." After practicing them, the boys are to appear the next morning with the words and meanings retained in memory. In 1580 the Harrow rules explicitly state that "three words" are to be given each night — but they probably mean the words clustering round each subject, *e.g.* parts of the body, diseases, virtues, vices, herbs, fishes, trees, etc.

Apparently the earliest printed vocabulary was that of John Stanbridge, *c.* 1500, and this book continued in use as late as 1630, the latest revision having been made by John Brinsley, the author of the *Ludus literarius.* The vocabulary developed into the dictionary form. The first Latin dictionary of Renaissance times was that of Ambrosius Calepinus, published at Reggio in 1502. Calepinus made a great collection of Latin words from Latin writers, and included meanings in Italian and other languages. Eventually the dictionary was not only Latin, but polyglot, containing in its greatest expansion eleven languages. From Calepinus Robert Stephanus adopted a *Dictionarium,* in Latin and French, in 1531. This was the first great Latin dictionary to illustrate the force of words in idioms and to indicate shade of meanings of words as used in various writers. It was quickly followed, in 1535, by *Observationes in M. Tullium Ciceronem,* a dictionary of words used by Cicero, written by Marius Nizolius, generally known as the *Thesaurus Ciceronianus.* Laurentius Valla's *Elegantiarum linguæ Latinæ libri sex* in 1471 and the *Cornucopia sive linguæ Latinæ Commentarii,* 1489, of Nicholas Perotti, though gladly used as dictionaries by happy owners, were rather essays in philological and literary criticism on a large scale. But such crude criticism was overshadowed by Julius Cæsar Scaliger in his *De Causis Latinæ Linguæ,* 1540, in which he claimed to enumerate 634 errors in Valla. Erasmus wrote books which were used for teaching purposes. Of the dictionary kind were the *Adagia,* the first form of which appeared in 1500, the *Copia Verborum* in 1511; the *Parabolæ sive Similia,* 1513. The *Colloquia,* 1516 (see Colloquies), was perhaps Erasmus's chief schoolbook, but it is not of the dictionary type. The *Adagia* were proverbs in Greek of which he gave a translation and exposition. The *Copia Verborum* supplied variety and fullness of language for composition instead of the old barbarisms and inelegancies. The *Apophthegmata* of Erasmus was not published till 1531. It was not till 1538 that in England was produced a Latin dictionary, that of Sir Thomas Elyot. Elyot states his indebtedness to the old collections of words of Festus, Varro, Nonius, Nestor. Of the moderns, he had taken from Laurentius Valla, Perotti's *Cornucopia*, the Italian "friar," Calepin, the Spanish Antonius Ælius Nebrissensis (*Dictionarium latino-hispanicum et hispano-latinum*, 1532), the French Guillaume Budé (*Lexicon græco-latinum*, 1530). In 1565 Thomas Cooper, at one time Bishop of Lincoln, compiled his *Thesaurus* based on Elyot and on Stephens. This was followed by the Latin dictionaries of E. Grant, 1581, based on Jean Crespin (Geneva, 1562); Rudolph Waddington, grounded on Stephens and Véron, 1584. John Minsheu's *Ductor in linguas*, a polyglot dictionary including Latin, followed in 1599. John Rider and Francis Holyoke produced their notable Latin dictionary in 1617, in which Philemon Holland helped. This was improved upon by Holyoke in 1633, in his *Dictionarium Etymologicum Latinum.* But it was in 1677 that Holyoke's son Thomas completed the large dictionary proudly asserted to be "the most complete and useful of any that was ever yet extant in this kind."

But dictionaries were for scholars and schoolmasters, ordinarily not for pupils, though Hoole in 1660 places them among reference books to be kept for use by the scholars. There was published, however, a *Short Dictionary for Young Beginners* by John Withals, the earliest edition of which is traced to 1556. This was essentially an English-Latin vocabulary, arranged according to subjects, giving the names of objects clustered together under heads of the sky, elements, winds, birds, the sea, fishes, etc. This book was revised by Dr. Evans, Abr. Fleming, and last by William Clark (in 1634). The later editions confessedly obtained material from the well-known Hadrian Junius's *Nomenclator* (1567). The last editor explains that the order is not alphabetical, because another method enables the grouping of helpful expressions around any object. Thus with the words "night" and "day" can appear the expressions "it is dark," "it is clear," and other sentences, proverbs, and sayings which relate to these topics. The object is to provide the young scholars with materials for Latin conversation. (See above on LATIN SPEAKING.) It is probable, however, that no work in this field was so important in the history of language teaching as the *Janua Linguarum* (1611) of William Bathe or Batæus (1564–1614), an Irish Jesuit on the staff of the Irish College at Salamanca. The Spanish *Janua* consisted of some 1150 (sentences 1042 to 1100 being omitted) sentences or *centuriæ* in Latin, with a Spanish translation on opposite pages, an *Appendix de Ambiguis*, defining nouns and verbs with various meanings, and an *Index* containing about 5300 words, based on Calepinus, and giving a translation in Spanish and reference to their use in the sentences. The centuries of sentences are grouped around some central topic; thus, the first five centuries deal with the cardinal virtues; the sixth with human activity; the seventh with peace and strife, and so on; only the last century is built on a different plan. The *Janua Linguarum* was at once accepted as a model, and many other works in different languages appeared, following the lines of Bathe's work; the best known of these is the *Janua linguarum reserata* (1631) of Comenius (*q.v.*). (See Corcoran, T., *History of Classical Teaching*, Dublin, 1911.) From what has been said of vocabularies, nomenclators, and such dictionaries as this of John Withals, it will be seen that there was plenty of previous material for John Amos Comenius (*q.v.*) when he came to compile his *Janua linguarum reserata* (which is a vocabulary arranged in topics and sentences about them) in 1631 and his *Orbis pictus* in 1657.

Grammar. — All through the Middle Ages the instruction had been "direct," for pupils could not afford Mss. books, and in many cases even the teachers did not possess them. Ælius Donatus, a grammarian of the fourth century A.D., wrote the one elementary Latin grammar which was in use for a thousand years. For a full account, see C. Thurot, *Extraits des manuscrits latins* (Paris, 1869). But with an oral system of teaching, and with a paucity of Mss. even of Donatus's Accidence, teaching material and methods became traditional, and teachers taught largely according to the practice or "use" of the teachers under whom they were themselves taught. The famous school attached to the hospital of St. John at Banbury under the régime of John Stanbridge seems to have established a prestige in method of Latin grammar, and the phrase "after the manner of Banbury School" perpetuated Stanbridge's fame and his method. The other grammars of the middle ages were not simple like Donatus's. Priscian and his subtleties gave way to the still more abstract, metaphysical, and fantastic speculation of Alexander de Villa Dei, and other textbooks, or traditions of them, such as those held up to scorn by Erasmus, *e.g.* Florista (Ludolf of Luchow), Papias, Hugutio, Michael Modista, and Eberhard of Béthune. Grammar had become a "speculative," not a practical study, and one of the keenest desires of the Renaissance teachers became the unification and standardization of grammar. The earliest printed grammar in England was that of 1481 at Oxford. The next to claim attention is John Holt's *Lac Puerorum*, 1497. Stanbridge and Whyttington supplied many forms of the Latin Accidence, but this made the case still stronger for a uniform grammar. The later most important names connected with the evolution of the authorized Latin grammar of 1540 are William Lily, Thomas Linacre, John Colet, Erasmus, and Cardinal Wolsey.

Lily had been at work on an elementary Latin grammar as far back as 1509, and a letter of Colet in 1520 speaks of the book as an accomplished fact, and as Lily's book, to be used by him as first master of St. Paul's School. A further letter of Colet dated 1513 refers to it as Colet's own gift. The earliest printed copy is that of the *Absolutissimus de octo orationis partium instructione libellus,* published at Basle in 1515, and at Strassburg in 1515. It consists of twenty-one leaves, and contains a preface by Erasmus, disclaiming the authorship, and acknowledging that he had readily made emendations in it, but that it was Lily's composition. The fact seems to be that Colet made the first draft, Lily supplied emendations and probably wrote the syntax, and was commissioned by Colet to mark any further examples for inclusion as they occurred in the reading of classic authors with the boys. Lily meantime sent the little book to Erasmus for suggestions, and the report arose that it was entirely Erasmus's own work. It is to be noted that William Lily died in 1522, so the title of Lily's Grammar is only correct for the part composed before that date. In 1523 Thomas Linacre composed his *Rudimenta Grammatices* for the use of the Princess Mary. As Juan Luis Vives wrote about the same time a scheme of studies for the Princess, and as the two documents were sometimes printed together, the mistake has been made of regarding them as joint authors of a Latin grammar. Linacre's *Rudimenta Grammatices* is not to be compared with his *De Emendata Structura Latini Sermonis* of 1524, a much more elaborate work. Colet died in 1519, but his *Æditio,* as his Accidence is called, was not published till 1527. This Latin title must not be allowed to obscure the fact that Colet's grammar is in English. In it is an emphatic statement of the Renaissance view of grammar teaching, of which the essence is that Latin speech was before, and is before, grammar rules. Colet's *Æditio* contains Lily's Syntax in English and Lily's verses to his scholars *De Moribus.* In 1528 Cardinal Wolsey entered the grammar arena, with his *Rudimenta Grammatices* of thirty-four leaves. Wolsey (? 1475–1530) had been a Fellow of Magdalen College, Oxford, like Lily, and, as is sometimes forgotten, had been a master in the Magdalen College School (1498). In the Preface to his *Rudimenta,* he gives his remarkable sketch of studies and methods to be pursued by the masters of Ipswich Grammar School, and evidently his plans were intended as a model for other schools. The "lytell proheme," and the Accidence are borrowed whole from Colet, as also are Lily's contributions to Colet's grammar. Other contributors were pressed into the service of the so-called Lily's Grammar, *e.g.,* Thomas Robertson (from 1524 to 1534), master of Magdalen College School, Oxford, who gave the *Quæ genus* and versifying rules with it.

With these new grammars and the survival of medieval grammars and grammar traditions there sprang up a great diversity in the course of teaching. In 1540 came King Henry VIII's Proclamation that "As his Majesty purposeth to establish his people in one consent and harmony of pure and true religion: so his tender goodness towards the youth and childhood of his realm intendeth to have it brought up under one absolute and uniform sort of learning." Hitherto, the King goes on to say, every master had his grammar, and every school, diverse teachings, and "the changing of masters and schools did many times utterly dull and undo good wits." Accordingly he commands that Lily's Grammar is to be used and "none other." The first edition traceable is that of 1542 (two years after the Proclamation) and the exact title of what was constantly called Lily's Grammar is: *An Introduction of the eyght partes of speche and the construction of the same, compiled and set by the commandement of our most gracious sovereign Lorde the King* (anno 1542). Contrary to the earlier grammars, this official grammar is in Latin. It is now unknown who were the commissioners to determine the exact contents of the authorized grammar, excepting that it is traditionary that Dr. Richard Cox, tutor to King Edward VI, was one of them.

Lily's grammar was thus in supreme authority from 1540 onward. In 1758 it was appropriated as the Eton grammar, and its use in Eton College continued till about 1868. From 1758 to the present its authority has quietly declined and vanished, without enactment. As a business monopoly, Lily's grammar was very valuable, considerable sums being paid for it as "rent." It passed through the hands of Francis Flower and John Battersby to John Norton, and in the family of the Nortons it remained for generations, with license to print granted to the universities. Ecclesiastical sanction was given to it by *Articles of Visitation* of the archbishops and bishops, who inquired if any other grammar was being used in any schools to its detriment. Attempts were made unsuccessfully to upset its authority in Convocation in 1664 and in the House of Lords in 1675.

There were many attempts at emendations of the King's or Lily's grammar, by translations of the Latin parts, by various forms of exposition or "elucidation," by "praxes" on it, and by writings which announced themselves as friendly to it, but as supplementary. Among these were Thomas Granger's *Syntagma Grammaticum,* 1616; John Danes's *Light to Lily,* 1631; John Clarke (of Lincoln), *Dux Grammaticus,* 1633; Thomas Hayne's *Compendium,* 1637; James Shirley (the dramatist schoolmaster), *Via ad Latinam Linguam,* 1649, and Charles Hoole's *Latin Grammar,* 1651, his

Common Rudiments, 1651, and his *Easie Entrance*, 1659. In addition to these there were the foreign Latin grammars such as those of Peter Ramus, Antonio de Lebrixa, Vossius, etc. In 1641 Thomas Farnaby curiously enough obtained a special authorization for his *Systema Grammaticum*, too learned a work for ordinary school use; and, as is not always remembered, Jeremy Taylor in 1647 and John Milton in 1669, wrote short and easy Latin grammars. Two other Latin grammars had some good points, those of John Brookbank, *A Breviate of our King's whole Latin Grammar vulgarly called Lillie's*, 1660, and Richard Lloyd's *Latin Grammar*, 1653.

The diversity of grammars grew apace. In 1726, the particularly good *Grammar of the Latin Tongue* by Solomon Lowe gives a list of 186 writers of Latin grammars whose works had been or were in use in England at that date. Criticism of the authorized grammar culminated in a work of Richard Johnson, master of the Free School, Nottingham, entitled: *Grammatical Commentaries, being an Apparatus to a new National Grammar, by way of Animadversion upon the Falsities, Obscurities, Redundancies and Defects of Lilly's system now in use: in which also are noticed many errors of the most eminent Grammarians, both ancient and modern*, 1706.

But controversy was carried further than the question of an authorized grammar. Dr. Joseph Webbe (d. *c.* 1633) was a physician-grammarian, who enthusiastically urged that Latin as a language was to be learned entirely from Latin authors, independently of systematic and elaborate grammars, authorized or unauthorized. Other writers wished grammar to be taught by an appeal to realistic teaching, a method which Comenius's *Orbis pictus*, 1657, greatly stimulated. The whole history of Lily's grammar affords the most striking instance of the failure to maintain the use of a particular book by giving it special royal authorization.

Besides dictionaries, grammars, colloquies (*q.v.*), verse making (*q.v.*), rhetoric (see RHETORIC), the Latin apparatus was chiefly concerned with Latin letter writing, theme writing, and other forms of Latin composition. The great *desideratum* was the material on which the pupil could express himself in Latin speech and writing, good subject matter and elegant and eloquent phrases and idioms.

The *Adagia, Copia Verborum*, and *Apophthegms* of Erasmus had succeeded to the old *Vulgaria* of Horman and others, all of which has been drawn up with the purpose of assisting the "making of Latins." The books to help in the writing of letters were numerous. Among the most important were those of Erasmus and Vives, *De conscribendis epistolis*, and of Englishmen, John Clarke's *Epistolographia*. In theme writing, Aphthonius of the fourth century A.D. was reëstablished as an ancient authority for method. For subject matter Reusner's *Symbolæ*, Lycosthene's *Apophthegmata*, 1555, and all sorts of books of *Flores*, and sayings from the classics and modern writers, especially on the subject of morals, were the hunting ground of boys for their themes. For phrases and elegant expressions, Valla, Erasmus, Aldus Manutius, and the English collections of *Calliopœia* (1613) and *Bibliotheca Scholastica Instructissima*, 1633, both by Thomas Draxe, were recommended. In addition, in the seventeenth century came John Clarke's *Phraseologia puerilis*, 1638, Hugh Robinson's *Scholæ Wintoniensis Phrases Latinæ*, 1658, Thomas Willis's *Proteus Vinctus* 1655, and William Walker's *Dictionary of English and Latin Idioms*, 1670. But the largest in this sort was William Robertson's *Phraseologia Generalis*, 1686, consisting of about 1400 closely printed double-columned pages. Solomon Lowe, in his *Latin Grammar*, 1726, not only enumerated the writers of Latin grammars, but also stated the names of 118 authors of these vocabularies, phrase books, examples, and sententiæ, who were or had been used in England.

The tendency of these analytical products of phrases and expressions was toward isolated scraps of knowledge. This tendency was intensified by the use of compends or epitomes into which every solid subject of study was brought. Francis Bacon was led to call these "epitomes" the "corruptions and moths of histories, which had made excellent histories bare and unprofitable dregs." The theory on which epitomes and the collection of phrases had been based was probably the usefulness of the method when the collections were made by the pupil himself. For the use of paper books in the collection of literary phrases, examples, and commonplace extracts was much older than Ascham, who is sometimes thought to be the first suggestor, and remained throughout the seventeenth and even eighteenth centuries a most valuable method. For in the old English grammar schools the processes of classical training depended largely on the active initiation of the pupil to gain such control over what he read in authors that he should be able to use it again, in new form, from his own independent standpoint of free composition and speech. The employment of highly analytical methods for the sake of copiousness and elegancy of expression in Latin speech and composition (which brought into the schools the excellent piece of work of William Walker on the *Particles* in 1663) produced a plethora of books to supply pupils both with subject matter and choice expressions for all manner of subjects on which they had to write. The very development of classical learning brought a state of Latin *apparatus*, which took away the old Renaissance sense of initiative on the part of the learner by offering him full provision ready to hand to meet all his wants, and was joined with a corresponding degeneracy of especially the weaker schoolmasters and schools, so common in the eighteenth century. F. W.

See COLLOQUIES; COMMONPLACE BOOK; DICTIONARIES; GRAMMAR; VISUAL AIDS TO TEACHING; also DONATUS; PRISCIAN; LILY; and the other grammarians referred to.

Latin, Teaching of. — The position occupied by Latin in the curriculum of the secondary school is due primarily to tradition. During the Middle Ages and at the Revival of Learning Latin was the medium of communication in science, literature, and politics. Consequently it was the first and most important element in education; supplemented by Greek and mathematics, it formed the whole curriculum. (See GRAMMAR SCHOOLS.) In the seventeenth century the native tongue began to form a small part of the course of study. This was followed in the eighteenth century by the modern foreign languages, and in the nineteenth by the various sciences. Practically all the time devoted to them was taken from that allotted to Latin and Greek. The process has continued until now Greek is omitted from the curriculum in practically all public high schools and in most private ones, and Latin has been reduced to modest proportions. (See GREEK IN THE SCHOOLS.) Latin now occupies about one fifth of the total time of the secondary schools, but it has to maintain itself against vehement criticism and opposition. The critics maintain that Latin is not a "practical" subject, and that the results of Latin teaching are entirely disproportionate to the amount of time which it demands. The defenders of Latin urge two main reasons for its retention in at least its present condition: (1) its value as a mental discipline, (2) its value as a practical subject.

The value of Latin, or of any subject in particular, as a mental discipline, has been much impugned in recent years, particularly by the psychologists, but there is a tendency now apparent to recede from the extreme position in this regard, and there is abundant testimony from unprejudiced observers in all walks of life to the value of Latin as a training instrument. For above every other subject it trains (1) the process of observation, (2) the function of correct record, (3) the reasoning power and general intelligence in correct inference from recorded observations. To this should be added its great value in developing the power of voluntary attention.

The value of Latin as a practical subject has to do particularly with the effect of the language in the cultivation of English style. In the English vocabulary a very large proportion of words in everyday use are of Latin origin, and it has been estimated that two thirds of the Latin vocabulary of the classical period has in some form or other come over into English speech. For the correct use of synonyms in English and the habit of expressing one's thoughts clearly, concisely, and cogently, a discriminating knowledge of Latin is indispensable, and while not every pupil in the school may be expected to develop a good style, nevertheless he should be given the necessary foundation for it.

When we turn to literature, we find that Latin is influential everywhere — particularly in our classical authors — by allusion, by quotation, by actual domestication. Many of our great English writers are permeated with Latin. We cannot expect that all will desire to feed their minds on the works of our greatest authors, however much we might prefer it; but certainly we should not deprive them of one of the most important elements in their enjoyment should they be so minded.

The criticism of the results of Latin teaching has borne more heavily in recent years, and teachers are coming to realize that this criticism has genuine foundation. There has been, therefore, much discussion as to improvement of method, and many suggestions, particularly by editors of textbooks. It may be said in general that the tendency of these suggestions has been toward greater emphasis upon oral teaching and the testing of acquaintance with the language by the ability to read its ordinary forms at sight. It has been too true that the value of the exercise in translation, which, when properly done, should be very great, has been seriously impaired by the very widespread use of English translations, a practice which results in slow progress on the one hand, and dulled moral sense on the other. Then, too, in most of our colleges the classes, particularly in the earlier years, have been so large that adequate personal attention to individual students has been impossible, and this difficulty is becoming more and more serious in secondary instruction with the rapid growth of our public high schools. Administrative officers have shown a curious disinclination to treat languages with the same consideration that is extended to the sciences. While it is accepted without question that scientific instruction without individual laboratory work under the eye of laboratory assistants is impossible, the equally obvious fact that instruction in languages without similar practice can be only haphazard and slipshod, is either not perceived or knowingly neglected.

Naturally in the teaching of any language we should begin with the essentials of grammar, together with sufficient exercises to insure the complete learning of the forms, and enough of the syntax to make the reading of simple sentences possible. This would be followed by easy reading, and then by more difficult reading, until the student acquires sufficient mastery to read with some ease whatever he would naturally come in contact with. And this is practically (with certain restrictions) what has been followed for centuries in the teaching of Latin. The question has been chiefly as to the nature of the instruction in the first year and the sequence of reading material. In the main the colleges have dominated the high school curriculum in America by their requirements for admission, and thus we find that for a long period the course of instruction in the high schools has been the beginner's book, a certain amount of Cæsar, certain orations of Cicero, certain books of Vergil's *Æneid*. (See COURSE OF STUDY.) When the high school course has been four years in length, as is the case almost everywhere, one year has been devoted to every one of these four subjects. Where the course is five years, or six, teachers have enlarged it by the addition of Ovid, Nepos, Sallust, and in some cases have increased the time devoted to the beginner's book so as to spend upon it a year and a half.

In recent years there has developed a strong feeling that the prescription of so much reading has a deleterious effect upon the teaching in the schools, and that better results could be attained if there were less definite prescription of authors and more insistence on the ability to translate easy Latin at sight.

The first year of Latin is the most important work in the whole high school curriculum. This importance lies in the fact that the pupil is studying not only Latin, but the phenomena of organic speech. In some schools in Germany and in England the pupil makes his first acquaintance with a foreign language in the study of French; but this practice has not taken root in the United States, and there the first serious study of linguistic expression begins in the Latin classroom.

Let us see for the moment what the problems of the Latin student are, what the English-speaking child will find difficult or unusual. First and foremost, he will be struck by the Latin forms. English is practically a formless language; the few terminations remaining are not sufficient to form a foundation for the careful study of the expression of ideas by means of termination. The pupil will now for the first time have to distinguish between the various cases of the noun and the various tenses and moods of the verb. This comes as a shock to the average English-speaking child, and it requires months upon months of careful and insistent drill before the expression of case relations by changes in termination becomes second nature. For example, in an English sentence like, "The boy strikes the dog with a stick," outside of the *s* in the verb no indication of meaning is given by any termination, and the three substantives would suffer no change in form, no matter what change in meaning might be brought about by transposition. On the other hand, in Latin the syntax would be expressed not merely by the sense, but also by a formal difference in every noun. Furthermore, the pupil would be troubled by even the simplest syntactical structure. An English sentence like, "The father gave his son some money that he might buy the book," is comprehensible to the child without any serious mental effort; but in the Latin sentence he must become acquainted with the idea of purpose and its expression and the use of mood to take the place of the auxiliary. This difficulty is immeasureably enhanced when "to buy" takes the place of "that he might buy." Another difficulty which is none the less real is that of pronunciation. For the first time the pupil comes into contact with what is essentially the Indo-Germanic system of sound expression, from which English has seriously varied. Then, too, there is word order and its possibilities in an inflected language. With these difficulties staring him in the face, and with progress made exceedingly slow on account of the necessity of accurate thinking along several lines at the same time, the first-year Latin taxes the patience, the ingenuity, and the skill of even the best of teachers. And in the United States in particular, owing to conspicuous administrative incompetence, the work of the first year is usually in the hands of the most inexperienced teacher.

The Introductory Work; the Customary Method. — The material is provided in the numerous first-year books, which show almost every possible idiosyncrasy of method. It may be said in general that they embody the carefully thought out schemes of the individual authors. They follow two main lines of presentation, one of which may be called the block system, the other the fragmentary system. In the latter — and by far the most influential — the lessons, particularly the earlier ones, are so divided that fragments of declension and fragments of conjugation alternate with each other; thus, either the nominative singular, or the nominative and accusative singular, or the nominative singular and the nominative plural of the first and second declensions are followed by the present indicative, singular number, or third person singular and plural, as the case may be. Subsequent lessons fill out the paradigms of the first and second declensions and the first conjugation, after which the other conjugations and the remaining declensions are taken up. In the mean time elementary rules of syntax, such as the agreement of the subject and the verb, the government of the accusative case, the ablative of instrument, the ablative of place, the dative of possessor, the objective or possessive genitive, the use of *ut* to express purpose, sometimes the use of *cum* in the sense of "when" are scattered along according to the caprice of the author. The object of thus breaking up inflectional groups is to provide early in the course reading material which will have in itself some reason for existence, and thus avoid the aridity of the old-fashioned textbook. In the former class, the textbook gives first the declensions in their order, supplementing them only by so much of the verb inflection as seems necessary to make the construction of sentences possible; then follow the conjugations in their order. The earlier exercises from English into Latin and from Latin into English are largely confined to the translation of detached forms. The critics of the first system maintain that it divorces things that belong together; those of the second that it makes the early Latin work not merely dull, but practically hopeless, because the pupils see no evidence of progress. As a matter of fact, the superiority of the first method to the second is merely specious, and the fragmentary acquisition of forms carries with it many evils. A third method of presenting forms, advocated by a few, is what one might call the topical treatment. The pupil begins with the study of a case throughout all its formations, and after proceeding through the declensions he takes up the verb similarly. Every one of these three methods requires a live teacher to make it successful, and practically, therefore, none shows any superiority over the other. Theoretically the second method is preferable, supplemented by the third wherever feasible, the first being the least defensible of them all.

The selection of the material of the first book involves the three divisions of forms, syntax, and vocabulary. It is generally agreed that unusual forms should be excluded, on the principle that only those in most common use are vital, while the unusual ones can better be learned (if learned at all) where they occur. Consequently the old apparatus of rule followed by exception has practically disappeared, and the beginner's book lays particular stress upon the normalities of language. This principle, however, suffers some modification in practice. It is frequently easier to learn the complete series, even though some of the elements are rare, than to break it up into fragments; the effort of mind is often much greater in the second case. The terminations are best learned in groups, even though examples of some of them are comparatively infrequent. Principal parts are best learned complete, though in the case of many verbs certain of them are never found. In the main, however, the principle is sound. In the case of syntax the situation is different. Comparatively little syntax should be given in the beginner's books, and this should be not necessarily the most common; but the most simple, for the learning of forms taxes primarily the memory, while the study of syntax exercises principally the reason. Therefore the indicative constructions should appear in the beginner's books, and only those uses of the subjunctive which make but slight demand upon the reasoning power, such as its use in wishes, in expressions of purpose and result, and little else. It is customary in the beginner's books to devote the last few lessons to the more elaborate constructions; but conditional sentences and the whole body of constructions with *dum* and the like, *quin*, *quominus*, and concessive clauses would better be deferred to the second year. The same is true of the more involved relative constructions.

The choice of vocabulary obviously depends upon the aim of Latin teaching in general. If, it is generally argued, we taught pupils to speak Latin as we did formerly, we should naturally require a colloquial vocabulary, but since our chief aim now is to give the means of reading Latin literature, we must choose the vocabulary with this end in view. A number of beginner's books claim to limit the vocabulary to the words in most common use in Cæsar. This practice is sound, because it has been found that these words are also in common use throughout the literature, while birds and animals, furniture and everyday occupations would leave the pupil absolutely helpless before a page of any Latin author. The size of the vocabulary for the first year should be about 500 words, and the textbooks usually show about that number. But no fixed list of words can be learned completely by all the pupils, and a certain margin must be allowed for forgetfulness, consequently the beginner's book would do well to show a vocabulary slightly in excess of 500.

The exercises in translation are usually divided into Latin-English and English-Latin. Some teachers hold that no translation from English into Latin should be expected until very substantial progress in the learning of forms has been secured, perhaps not until the middle of the year; but the weight of opinion inclines to the view that translation from English into Latin should begin with the first lesson. This work, however, is very much more difficult than translation from Latin into English, and the demands in vocabulary and syntax should accordingly be lessened.

The Oral or Direct Method. — Dissatisfaction with the results of the traditional method have led in recent years to the employment of the oral or direct method. The advocates of the latter insist that Latin should be taught as if it were a modern spoken language, consequently they follow in general the principles of direct teaching as employed in the teaching of modern languages. Almost from the very beginning Latin is the customary language of the classroom. At the outset short commands and questions having to do with the necessary activities and surroundings of the classroom form the means of instruction. The pupils are required to answer every question in Latin and to follow every command with a statement of what they are doing. As they progress the range of vocabulary is enlarged, but still restricted primarily to the ordinary activities of life. After a little time the teacher tells the class short stories in Latin, explaining the meaning of unfamiliar words in the same tongue and requiring the class to give him back the story in such Latin as they can command. In this method translation, whether from Latin into English or from English into Latin, is practically unknown. This is reserved for the period when the pupil, having obtained a ready command with the fundamental principles of Latin, is ready to begin that comparison of Latin and English idiom which renders translation so valuable an exercise. Drill in syntax is obtained partly by the oral exercises, partly by written work. To provide for this drill the teacher may require his pupils to embody such and such constructions in the written work, while in the oral work he may have the various ideas expressed first in one fashion and then in another, turned from active to passive, or from the independent to the dependent form. Short narratives composed of independent sentences may be rewritten so as to involve various kinds of subordination. The effect of such training is to make the forms of the Latin language second nature to the pupils, and to reduce the strain upon the memory by constant practice. The method requires a great deal of ingenuity and readiness on the part of the teacher, for every opportunity afforded by any chance remark of the pupil must be improved at once; but in the hand of a competent teacher the results are claimed to be vastly superior to those of the old method. After some months the pupils have a greater grasp of the forms and easy syntax of the language, and are then prepared to go on to serious reading with much greater ease. The chief drawback of the direct method is one of time. The earlier stages require a great deal more time than is required by the old method, but the advocates of the new method maintain that what is lost in speed is more than gained in definiteness and quality of knowledge, and that in the subsequent years the previous delay is much more than made up. One of the important results of this method is that pupils feel that they have a certain control of the language and are thus relieved of the temptation to use unfair means in preparation.

Very recently in the United States an attempt has been made to modify the traditional method by adding to it some of the features of the new method. Recent textbooks give more attention to colloquial features, and the vocabulary of the earlier lessons has to do with the ordinary activities of life. But this choice of vocabulary is intended merely to facilitate the colloquial handling of the language by the pupils, and is expected to give way to the normal literary vocabulary as soon as the serious reading of Latin literature is begun.

Pronunciation. — Whatever method is employed, the initial difficulty is that of pronunciation. The Roman method is commonly employed. Objections are occasionally made to it but its foundation is secure both in knowledge and in intellectual honesty. It is frequently said that we do not know how the Romans pronounced. This is true only to the extent that those who have not actually heard a modern language do not know how it is pronounced. We have a fairly accurate knowledge of the sounds of the Latin letters, and we have special directions as to the position of the organs of speech in articulation. While some of these directions come from a comparatively late period, — as late, in fact, as the sixth century A.D., — yet the laws of linguistic development show conclusively that the directions of this period involve certain preceding conditions which can be postulated with accuracy. To determine Roman pronunciation we have, besides the directions of the grammarians just alluded to, transliterations of Greek words into Latin and of Latin words into Greek. We have inscriptional evidence as to the length of the vowels, occasional remarks in Latin literature touching upon pronunciation, and the evidence presented by the Romance languages, which modified in transition the Latin sounds after a definite manner. We are able, therefore, to give in the textbooks the sounds of the Latin letters with practically as much certainty as we can the sounds of a modern language in textbooks for foreign use. To the ear of a Cicero a modern Latinist would speak with an "accent" but he would be understood. It is the business of the teacher to show in pronunciation a careful attention to exact enunciation and to require on the part of the pupils the same accuracy. The pupil should never hear a Latin word mispronounced by the teacher. The Latin that is to be translated should if possible be read aloud by the pupil, and such practice should be continuous. A little careful practice every day is better than a great deal at intervals. The teacher should pay attention particularly to the quantities of all the vowels in his own enunciation and to syllabic division; the pupil, however, should not be forced to learn anything but the quantity of terminations and penultimate syllables. The former should be learned in the acquisition of the forms, the later on meeting with the new word. Inasmuch as Latin accent depends upon the length of the penult, it is not necessary to require a careful marking of the earlier syllables in the word, except, where it is an obvious derivative of a form already known. Hidden quantities, so called, should not be required of the pupils, but the teacher should be careful to pronounce them correctly as far as our knowledge extends.

The Later Reading. — In many of the older English schools and in those American schools with a curriculum of more than four years, the introductory work extends over into the second year; but in the new English schools and in the vast majority of American schools the reading of genuine Latin begins in earnest with the beginning of the second year. The arrangement of the curriculum for subsequent years differs in different countries. In general Nepos and Cæsar are taken up first, and then a mixed combination, composed mainly of selections from Cicero, Ovid, and Vergil, but with possible substitutions of Livy, Sallust, and Terence, has been the habit. In the United States up to very recently the almost universal practice has been to devote the second year to Cæsar, the third to Cicero, the fourth to Vergil. The amount of Cæsar prescribed (four books) has proved to be a very severe task for the ordinary high school class. It has involved a definite advance every day, and it has thus been impossible in many cases to take account of weak students or to linger for the purpose of securing thoroughness. The plan recently adopted decreases the amount of reading specifically required and lays increased emphasis upon reading at sight and the acquisition of additional vocabulary. (See College Entrance Requirements.)

The transition from the beginner's book to Cæsar is difficult, and the pupil is apt to show a weakness entirely unexpected from the work of the previous year. This is due to the complexity of the periodic sentence. Word order and the various devices of subordination give a great deal of trouble. At the outset the teacher must be content with short lessons in which attention is paid particularly to the new constructions and the new words. He should also devote a good deal of attention to working over the Latin sentence into genuine English. The class should be drilled in the difference between Latin and English idiom, and should be required to translate at least the review passage into correct English. The work done during the class hour should be of two kinds: the work of the previous day should first be reviewed, and the rest of the hour should be devoted to a preliminary sight translation of the work of the next day under the guidance of the teacher. As far as possible, the home work should be restricted to the study of syntax (often in written exercises) and vocabulary. Every now and then the pupils should be required to write out in class the translation of a small portion (if only four or five lines) of the day's lesson, and these written translations should then be criticized by the teacher from the point of view of the English expression. One such exercise is worth a dozen oral translations for the appreciation on the part of the pupil of the difference between Latin and English expression. The teacher must never lose sight of the fact that from the beginning of the second year the most important part of the training is the development on the part of the pupil of the sense of style, by which is meant good English as an offset to good Latin. If the advantage claimed for the study of Latin in appreciation of English style is to be secured, it can only be done in this way.

Cæsar furnishes particular problems. In the main his narrative is simple, concrete, narrow in range of ideas, and easily followed. In fact, no author in the whole Latin literature is better suited for the reading of the second-year Latin. But Cæsar shows a fondness for the insertion of speeches in what is called indirect discourse. These have nothing to do with the narrative, and could be omitted without disturbance. The length of these speeches in the first book has led many teachers to begin with the second book. Such a practice is faulty in principle; and, inasmuch as the speeches are not necessary to the narrative, it is far better to begin with the first book, and for the teacher either to translate or to paraphrase the speeches as they occur in order merely to give the setting of the story. A good deal of stress has been laid upon the ability of the pupil to turn direct discourse into indirect discourse and the reverse, but it should be remembered that Cæsar is the only author whose style is characterized by indirect discourse in mass, and that, so far as the learning of Latin is concerned, the time devoted to the intricacies of indirect discourse would much better be devoted to more extended reading. Nevertheless, until we are prepared to give up Cæsar, some attention should be paid to the indirect discourse, and the speeches might well be reviewed toward the end of the year, when Cæsar's story is being studied as a whole.

In studying Cæsar due attention should be paid to the development of his narrative and to the Roman art of war. Pupils might be required after a campaign to write out an account of it, or they might be required to plan or describe a battle. Some attention may be paid to Cæsar as a man, his dealings with his troops, his attitude toward the State, the circumstances which led to the Civil War. But of course these studies should be supplemental merely; for after all, while Cæsar is history, he is being read primarily to learn Latin. If the plan of preparation indicated is followed, no particular effort need be made to develop the power to translate at sight, but a period may be devoted, perhaps as often as once a week, to sight translation only. The passage read may be merely a further section of the advance narrative, or interesting passages may be selected from the later books or from any other Latin of approximately equal difficulty.

During this year much attention must be paid to prose composition, and as this important exercise is for the purpose of systematic grammatical study, it should be done systematically from the beginning. The exercises should be graded in difficulty, and should follow a definite plan of syntactical development. They should, accordingly, not be merely based upon a small section of the text. All that can be expected is that the vocabulary should be that of the stage of study and that the style should be narrative. If the subject can be made either identical or similar with what the student is reading, so much the better. It is the habit of many to devote one period a week to prose composition. This is theoretically objectionable. It is better that a short exercise should be done every day. Review exercises embodying a number of principles previously studied may occupy the period every now and then; but one period a week devoted to Latin composition involves too long an interval between efforts. Oral composition in connection with the reading of the day may often be productive of excellent results.

When some of the *Lives* of Nepos are substituted for a portion of the Cæsar, the same general principle should be followed in the teaching, but the supplementary work would of course be different. Nepos is, however, not so suitable as Cæsar for this stage, because his vocabulary is much wider and involves many unusual words, and many of the conceptions are abstract. Nor does the brevity of the episodes serve to counterbalance the greater complexity of the periodic sentence.

Ordinarily Cæsar is followed by Cicero. Cicero not only represents the highest point of Latin classical style, but he was the greatest Roman orator and an important figure in the death struggle of the Republic. The orations usually chosen are the four against Catiline, the one on Pompey's command and the one for the poet Archias. The orations against Catiline are the easiest of all, and have an important political significance. The *Pro Lege Manilia*, in addition to being a comparatively early speech, marks the beginning of Pompey's growth as a great figure, and also forms a good opportunity to study the rhetorical elements in the orator's style. The *Pro Archia* is in effect a eulogy of Greek literature and a wonderful example of the panegyric style. Sometimes the teacher prefers to read a different set of speeches for the purpose of focusing the attention of the pupils upon some particular side of Cicero's multifarious career, and many teachers like to substitute for some of the speeches mentioned selections from Cicero's correspondence, chosen either to show the great orator's human side or to throw sidelights upon the history of the period. Some teachers regard Cicero as dull and uninteresting to pupils, and prefer at least to begin the third year with Vergil. This apparently unpedagogical practice is defended on the ground that Vergil, even if not thoroughly understood, is interesting on account of the narrative, that his style is not difficult, and that outside of the strangeness of the poetical dress, the narrative moves quickly and easily. Moreover, the syntax on the whole is easier than that of Cicero, because of the absence of involved sentences. Others begin the third year with Vergil, and after a time they take up Cicero completing both Cicero and Vergil in the fourth year. But this is all pedagogically unsound. Vergil should be deferred to the fourth year, because his writings are pure literature, and need for proper appreciation and enjoyment as much maturity of mind as can be brought to them. On the other hand, Cicero makes but small demands upon the mental maturity of his readers. In teaching Cicero it is proper to go more into detail about the history of the later years of the Republic and the condition of parties at Rome. The work of the Cæsar year in this regard might well be amplified, and the attempt made to give the pupils some rational idea of the workings of the Roman constitution, but the main stress should, of course, be laid upon the interpretation of the speeches themselves. The teacher should possess a great deal of imagination because Cicero is serious, ironical, humorous, jesting, or playful in turn, and his invective on the one side is offset by the deepest pathos on the other. Very often the point of the passage depends on the order of the words or the application of a particular word. References that seem blind can be lighted up by modern instances. Cicero's personal character and the main facts of his personal life should not be overlooked, and the teacher should try to lead his pupils to some understanding of the man whose soul was torn in two directions, who felt always the conflict between inclination and duty, who followed a sinking cause with his eyes open and remained true to his convictions even at the cost of life.

When Ovid is read, whether after Cæsar or Cicero, it serves as an introduction to Latin poetry and to ancient mythology. It also relieves the early study of Vergil of the drudgery usually attendant upon the shift from prose to verse, and makes it possible to treat Vergil as literature from the beginning. Selections from the *Metamorphoses* are usually chosen, because the narrative is easy. The chief difficulty is one of word order. To relieve this some editions have the earlier selections rewritten in prose order. Scansion also is a serious exercise for most pupils, even when they have been carefully trained in pronunciation from the beginning. Most teachers are content if some appreciation of rhythm is developed, and pay little attention to the conflict between verse and word accent that regularly obtains in the first part of the verse. Others maintain that, as Latin is a language of almost " level stress," the verse will scan itself, if the words are pronounced as they should be pronounced in prose. Few teachers, however, are able to reach this point of perfection, even in their own scanning.

It has been objected that because the works of Vergil represent the highest reach of the Roman imagination and the most finished product of Roman literary art, they should be reserved for the later period of study, when the attainments as well as the maturity of mind of the student are greater. If we were sure that our students were going to continue the study of Latin for some years, this objection would weigh; but the great majority of secondary pupils terminate their study of Latin with the high school course, and it seems indefensible that any should give up Latin after four years' study without having had the opportunity to read Vergil.

Since most American high schools prepare for the college examinations at the end of their course, it becomes necessary in the last year to devote considerable attention to a review of grammar and syntax. Vergil, however, is not well suited for this. His style is in general very simple; subordination is conspicuous by its absence; the subjunctive constructions that are so common in all Latin prose are comparatively rare. The syntax of the cases can, it is true, be studied with some effect because most of the so-called poetic usages have to do with case constructions; but these are the easiest, after all, and the pupil needs most to review the construction of the verb. This is best accomplished by the careful writing of Latin during the whole of the last year.

The selection usually read is the first six books of the *Æneid.* This is justified, first, by its extreme interest for all kinds of pupils, secondly by the fact that neither the *Bucolics* nor the *Georgics* treat matters of universal appeal. The subject and the vocabulary of the *Bucolics* were exotic to the Romans themselves. That of the *Georgics* is too specialized to warrant any great attention on the part of high school pupils. The first six books of the *Æneid* are without question the most important part of this poem, and they have a world interest which is not so much felt in the latter books.

In teaching Vergil the aims are altogether different from those that dominate the teaching of Cæsar and Cicero. Here is no place for the study of military operations, the colonial system or method of government, nor is there any occasion for investigation of party feuds and social relations. Since the Roman epic is a purely literary creation, stress should be laid as far as possible upon the literary element. The ancient mythology, the ancient simplicity of life, the ancient morality, all claim attention; but these are subordinate to the far-reaching literary interest which Vergil exercises upon all subsequent authors. Most of the school editions contain copious parallel passages from later literature. In many cases these are not genuine parallels, and the pupil either gets no impression or only a very vague one from reading them. This ought not to be the case. An attempt should be made to focus the attention of the students upon certain important features of English literature and upon certain particular authors who have been under classic influence. With that in view it would be well to treat at greater length the influence of Vergil upon Shakespeare, upon Tennyson, upon Milton, and so forth. This can be done usually with the material provided in the editions. The pupils should also be taught throughout to visualize the scenes, to form their own judgments as to the narrative in its various stages, to become independent in attitude. Here, too, extreme care should be exercised in translation. Poetic language should be rendered poetically. It will be the first experience of most students in distinguishing what is prosaic in expression from what is poetic, and the fact that Latin verse differs from Latin prose will be better understood if the difference between English prose and English verse is also shown. Images and metaphors should not be washed out. Due attention should be paid to the artistic setting, the picturesque qualities of every scene. The teacher should never lose sight of the fact that in teaching Vergil he is teaching the principles of literature in general, just as in the earlier years of the course he was teaching universal grammar. In this way Vergil ought to be not merely the proper culmination of the secondary Latin course, but also an important element of the pupil's general culture.

With a longer course Sallust's *Catilina* might be read as a foil to Cicero's *Catilinarians.* Variety may also be attained by selections from Terence or Livy, or by more extended anthologies, a large number of which are now available, adapted to the wants of pupils of different grades. G. L.

See Cæsar; Cicero; Nepos; Sallust; Vergil.

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LATIN SCHOOLS. — See GRAMMAR SCHOOLS; PUBLIC SCHOOLS; SECONDARY SCHOOLS; MIDDLE AGES, EDUCATION IN THE.

LATRINES, SANITARY. — Sanitary toilet systems for schools must satisfy the following general conditions: (1) They must be situated either in the building or near enough to secure privacy, close supervision, and also to prevent exposure during cold or inclement weather. (2) They must have sewer connections and be provided with individual wash-out seats, and urinals. In villages and country districts where sewer and water supply systems are not available, the air pressure tank system connected with force pump, manipulated by hand or some form of motor and septic tank disposal ought to be installed. (3) Each seat should be furnished with an individual automatic wash-out attachment, in addition to some general flushing system under control of the janitor. (4) In all cases where toilets are installed within school buildings, special construction of such rooms is necessary. They must have a cement or tiled floor, with outflow connections so that frequent scrubbing and flushing may be secured. The walls should be encased with light-colored glazed brick, or tile, both for the sake of cleanliness and the non-absorption of light. The ceilings should be furnished with hard cement plaster and painted with a light-colored water-proof paint. (5) The seats and urinals should be located along the inner walls of such rooms and faced toward the light. (6) Each toilet seat should be in a separate stall, fitted with doors. The custom of building the stalls without doors offends against both decency and modesty. These doors ought to be hinged and connected with a spring, so that when the seats are not in use the door will swing back into the stall so as to allow light and if possible direct sunshine to enter. The children could then be taught to close and latch the doors when they use the stalls. (7) Where toilets are within school buildings, down-draught ventilation through both the seats and urinals is necessary. This can be accomplished, when proper plumbing material is furnished, either by an exhaust fan connected with the vent ducts, or by the use of separate exhaust chimneys in which fires are kept burning. (8) Urinal stalls should be made with back, sides, and bottoms of white glass. Such material is now on the market, and is far better than slate, marble, or transparent glass. It is not absorbent, does not discolor, is easily cleaned, and furnishes privacy. (9) The flushing of urinal stalls is a matter of importance to prevent odors and insure cleanliness. The best form of flushing thus far developed consists in placing a well protected overflow trough on the upper part of the back of the stalls. The ordinary perforated pipe is liable to clog and fail in the proper distribution of the water over the entire surface of this part of the stall. (10) The bottom of the stall should slope slightly toward the back and deliver into a trough leading to sewer connections. This trough ought to be connected in such a manner that rubbish could not enter. (11) In large buildings, especially those of more than two stories for high schools or grammar grades, toilet facilities should be afforded on each floor. These should open from rest rooms or from secluded halls. It is an inexcusable blunder to locate toilets to open into corridors alongside of classrooms. (12) In all school buildings where playgrounds are afforded ample toilet facilities must be placed in basements or detached buildings, and these made easily, but indirectly, accessible.

The rural school buildings of our country are rarely furnished with even decent toilet facilities, not to mention sanitary matters. No reform in sanitation in country life is more to be desired at this time than that connected with sanitary toilet systems. Typhoid fever and hookworm disease, not to mention others, will never be eradicated until at every country school and every farmhouse sanitary toilets are available. F. B. D.

For references see under ARCHITECTURE, SCHOOL.

LAUD, WILLIAM (1573–1645). — Archbishop of Canterbury and Chancellor of Oxford University. After attending the free school in his native town, Reading, he proceeded to St. John's College, Oxford, from which he graduated B.A. in 1589, M.A. in 1598, and D.D. in 1608. In 1611 he became president of his college, a position which he retained until 1621. He held many preferments, and in 1633 became Archbishop of Canterbury. From 1630 to 1641 he was chancellor of the university. However reactionary Laud may have been in ecclesiastical and political matters, he exercised his position as head of the university to promote its welfare. He insisted on subscription of the three articles in the Thirty-sixth Canon by every candidate for a degree, on attendance at services and sermons, and on obedience to academic regulations, such as the wearing of academic dress, attendance at lectures, and taking examinations for degrees. Through his influence the use of Latin on all occasions was enforced. In 1628 on his inspiration a scheme was introduced for the appointment of proctors by each college in a certain cycle which eliminated the ever-recurring disputes. In 1636 were promulgated the Laudian or Caroline Statutes (*Corpus Statutorum*), which had been so carefully drafted under Laud's supervision that they remained practically until the University Reform Act was passed in 1854. While they destroyed the democratic control of university affairs, the Statutes introduced a good administrative system, at the head of which stood the Vice-Chancellor, appointed by the Chancellor and Convocation from among the heads of colleges. Public oral examinations for both the B.A. and M.A., based on a broad curriculum, were introduced and enforced, and superseded the obsolete disputations. Laud was a liberal benefactor of the university; he himself presented oriental Mss. and secured other literary gifts; he founded and endowed a chair in Arabic, and obtained for the university the privilege of printing Bibles. While his position warranted such action as he took in relation to Oxford, his proposal to visit Cambridge in 1636 to enforce Anglican discipline met with considerable opposition; and although his right as metropolitan was secured to him by royal decision, the threatened visitation never took place.

See OXFORD, UNIVERSITY OF.

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LAURIE, SIMON SOMERVILLE (1829–1909). — British educationalist, who held one of the first chairs in education established in Great Britain. In 1876 he was appointed first Professor of the Theory, History, and Practice of Education in the University of Edinburgh, and continued in office until his resignation in 1903. In 1882 an unsuccessful attempt was made to bring Laurie to Columbia University. His principal contributions to educational history and theory were: *Primary Instruction in Relation to Education* (1867); *Life and Educational Writings of John Amos Comenius* (1881); *Mediæval Education and the Rise and Constitution of Universities* (1886); *Language and Linguistic Method in the School* (1890); *Institutes of Education* (1892); *Historical Survey of Pre-Christian Education* (1900); *Studies in the History of Educational Opinion since the Renaissance* (1903). He is also well known as a writer on philosophy, his principal contributions in this department of knowledge being: *Metaphysica, Nova et Vetusta* (1884); *Ethica, or the Ethics of Reason* (1885) and *Synthetica, being Meditations epistemological and ontological* (Gifford lectures of the University of Edinburgh, 1905–1906). Laurie's theory of education is contained in his *Institutes*, first published in 1892, and his conception of the aims and methods of education is largely determined by his philosophical standpoint, and is the practical application of his views on metaphysics and ethics. His philosophy was to a large extent determined by his study of Kant, and to a lesser degree by his reading of Fichte and Hegel. According to Laurie, we may distinguish within experience two grades of knowledge; a sentient experience or knowledge in which facts and events are connected merely by their time and space connections. This kind of experience is found in the life of animals, of the young child, and a very large part of the experience of many men is of this nature. On the other hand, we may have a rational knowledge or experience in which events and facts are connected by means of internal or intrinsic connections. Now man differs from the animals in that he is an active reason, and the whole upward progress of man may be considered as the process by which sentient experience is lifted up or converted into rational experience. Hence on the ethical side, the work of reason is to ascertain the meaning of impulse and to rationalize it; and as a consequence the supreme end of education is to endeavor "to build up" in the mind of the child and youth a system of moral ideas which will constitute a permanent reservoir of motives always ready for use, whether in moral judgment or moral action. For "man is an ethical being only so far as he is a self-regulated being." Similarly, on the intellectual side, method in education is the active will or reason gradually converting this merely given sentient experience into rational knowledge, or it is the passing from the mere particulars of sense to the universals of reason. Hence in education the all-important thing is the evoking of the will or reason to undertake the task of rationalizing the given sentient experience. The difficulties of such a conception of experience are similar to those met with in Kant's philosophy. If we assume at the beginning a dualism within experience, it is difficult to conceive how this can be finally overcome. Of his historical writings the most important is the account of *Pre-Christian Education*. A. D.

See EDUCATION, ACADEMIC STUDY OF.

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LAUSANNE, THE UNIVERSITY OF. — One of the oldest institutions of higher learning in Switzerland, having been established as an academy as early as 1536. Its origin is directly connected with the introduction of the Reformation in French Switzerland, the academy serving as a training school for Protestant clergymen. It was not until the beginning of the nineteenth century, however, that the academy was extended, the first step in this direction being the establishment of chairs of philosophy and law. A closer approximation to a real university was secured in 1838, when a reorganization of the institution resulted in the formation of four faculties, — theology, law, pure science, and letters. The technical school (founded in 1853) was added in 1869, and four years later a school of pharmacy; in 1888 an independent medical school was founded, which had existed for several years before this as a special division of the faculty of pure science. The institution was finally raised to the rank of a university in 1890, and consists at the present time of the faculties of Protestant theology, law, medicine (including dentistry), letters (including a special school for the teaching of modern French), and science. The last mentioned is divided into three groups: (*a*) mathematics and natural sciences; (*b*) pharmacy; (*c*) engineering.

The language of instruction is French, but eight classes in the faculty of law are given in the German language, there being a fair number of German students at the university. The Cantonal Library contains about 285,000 books and pamphlets. In addition to the theological faculty of the university, there exists in Lausanne a divinity school of the Free Evangelical Church of the Canton of Vaud, established in 1847. Lausanne also possesses an academy of commerce. Both the latter and the university offer vacation courses during the summer months. Connected with the faculty of science is a special institute for agricultural chemistry, while with the faculty of medicine are affiliated a large and a smaller hospital, and a blind asylum with an ophthalmological clinic. In the summer semester of 1910 there were in attendance 1187 students, including 169 auditors, the matriculated students being distributed as follows: theology, 15; law, 267; medicine, 321; philosophy and science, 584. About one third of the students, including the majority of the auditors and almost half of the students in the medical school, are women, the percentage of matriculated women students at the Swiss universities being much higher than that at the German universities. R. T., JR.

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LAVAL UNIVERSITY, MONTREAL, CANADA. — A Catholic University established at the request of the Bishop of Montreal as a branch of the Laval University in Quebec. Faculties of theology and law were established in 1878; medicine in 1879; and arts in 1887, although the arts faculty has never been developed beyond the definite provision of courses in French. Instruction is in French, except in the faculty of theology, where Latin is used. Connected with the university are the following schools: École Polytechnique (1874); Comparative Medicine and Veterinary Science (1886); Dental Surgery (1894); Pharmacy (1906); Agricultural Institute (1893); Higher School for Young Women. The Montreal institution became wholly independent in the matter of administration in 1889; but the degrees are still conferred only by the Quebec institution. The enrollment of students is about 1000.

LAVAL UNIVERSITY, QUEBEC, CANADA. — A Catholic university, founded by the Seminary of Quebec in 1852, when the royal charter was obtained. The institution was recognized by a Papal Bull in 1872. There are four faculties: theology, law, medicine, and arts, and schools of surveying and forestry. The Visitor of the university is the Archbishop of Quebec, who appoints the professors in the faculty of theology. The university is administered by a rector, vice-rector, and a council consisting of the directors of the seminary and three senior professors in each faculty. A number of seminaries and colleges are affiliated with the universities. The enrollment of students in 1910–1911 was 421.

LAVATER, JOHANN KASPAR (1741–1801). — This passionate and influential Swiss preacher and writer achieved his career in his native city, Zurich. As a Protestant he was a champion of religious liberty, but at the same time narrow in his own theology. Because of his strong enthusiasms and convictions, and of the mystical tendencies in his thinking, he was frequently subject to charges of heresy. He was known also because of the friendships he formed with Fichte, Goethe, Pestalozzi, and others. His lively human sympathy, his keen observations of human faces, and his skill as an artist in sketching them enabled him to produce the memorable work on physiognomy on which his fame rests. In 1775–1778 he published in four volumes the *Physiognomische Fragmente* *zur Beförderung der Menschenkenntniss und Menschenliebe*, which has credited him with having founded the art of interpreting human character through expression, chiefly of the face. Without a knowledge of anatomy, he endeavored to frame a few principles to guide this art. The form of a human being is somehow significant of its inner nature. Character is expressed by movement. The mind's qualities are definitely and legibly expressed in the face. The book produced a great and lasting impression, although its scientific merit was limited. E. F. B.

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LAVATORIES. — See Latrines.

LAW. — Generally speaking, a law is the statement of an order or relation among the elements of an object or situation, this order or relation being a means of understanding, organizing, and controlling other traits of the object or situation in question, and of reducing other situations or objects, apparently unlike, to a form in which the same, or a closely connected, method of treatment is applicable. A law is thus, logically speaking, a statement of a relation or order which is employed as an effective method of procedure in further dealings with phenomena.

The kind of order that is significant and the kind of procedure that is indicated depends, of course, upon the character of the material dealt with. The fundamental distinction of subject matter is that between acts (or functions) and states (or structures). As the primary human concern is the maintenance of life, and especially of group or associated life, the first type of law to emerge into conscious recognition was the rules of order applicable to the activities of human beings in relation to one another, — laws in the *jural* sense, whether political or moral. Now a statement of an order among *acts*, when employed as a determining method with respect to further acts, is obviously a *rule of action.* It presented itself, accordingly, as having authority over phenomena, as in some sense a *command* or *injunction* to act in certain ways. When attention was directed to natural existences, and the effort was made to discover and state a uniform order among them, the inevitable tendency was to conceive of natural law after the analogy of jural law: as a disclosure of a superior authority which " governed " the particulars which were then conceived after the manner of subjects " obeying " law. The course of the authority to govern was referred to God, Nature, Forces, or Reason, according to the tenets of a philosophical school.

In the eighteenth and nineteenth centuries, the advance of science produced the positivistic movement. According to this movement, a law is simply a statement of an order of coexistence or sequence among phenomena (as the elements of a phenomenon). The conceptions of authority, of governing power and obedience were eliminated, being simply a formulation of uniformity abstracted from phenomena. This conception makes a complete break between jural and scientific law.

This distinction marked a most important advance in science and culture. Stated in this absolute form, it brought with it, however, its own peculiar difficulties. Jural and moral laws were conceived now only as a command, an imperative. Hence they seemed arbitrary, resting in ultimate analysis either upon mere superiority of force, or else upon purely ideal considerations of what should be, what *ought* to be, lacking positive, existential force and efficiency. In the first case, law meant despotism; in the second, an empty abstract conception of what ought to be, as over against what is. On the other hand, scientific and natural law, being conceived as merely a uniformity among things as they exist, was completely divorced from matters of action, save as action was reduced to the type of given physical existences — to the denial, accordingly, of its significant traits *as action.*

Various tendencies have converged to bring forward a third conception of law, which brings the practical and the scientific senses of the term into working relations with each other, eliminating, however, the sense of superior authority and of coercive command. What makes in any given case a statement of an order (whether physical or social) a law is its *use as a method of procedure* in dealing with further cases, with future possibilities. A scientific law is thus not a mere statement of coexistence; it is such a statement employed as a method of procedure in further inquiries, interpretations, and organizations. It is thus in some sense a rule of action, that is, a way of directing or guiding action in the region of investigation. Moreover, the statement of a uniform order is either limited to the particular cases in which it has been already observed, or else in its extension to new cases is hypothetical — a rule of anticipation, prediction, and probable behavior. In addition, through applied science and the arts such uniformities as are observed and abstracted are embodied in methods of controlling and adapting things to human needs, and thus pass into the realm of overt and social action.

From the side of social and moral concerns, a converse movement has taken place. With the development of democracy and freer intercourse, moral and political laws lose alike the form of rigid imperatives and of empty ideals, and tend to be conceived as a conception of an order of action adapted to securing ends of objective value. From both sides, accordingly, the sharp antithesis between a law of natural existence and one of practical endeavor is softened down, so that both intellectual and practical elements are included in the concept of law. J. D.

See GENERALIZATION; HYPOTHESIS; also ACTIVITY; PRAGMATISM.

LAW. — See PRINCIPLE.

LAW, EDUCATION FOR THE. — Historic and Sociological Position of Law. — Law shares with divinity the distinction of being the first of academic studies. The earliest university was the temple school, in which the divine law, which included the human, was inculcated, and in which the priest, who was also the lawyer, was trained for his sacred calling. Not through all its history, not through the long process of its secularization, not through all its vicissitudes of contempt and esteem, has the law ever quite lost its ancient distinction of a quasi-sacred doctrine to be seriously and reverently studied. Other professional studies, like that of medicine, have arisen, as a necessity of professional development, through the decay of the system of apprenticeship through which admittance to the guarded privileges of the profession was gained. Wherever legal education betrays this tendency, as it has in England, and, indeed, in all common law countries, the result has been due to special conditions, — in England, to a peculiar and distinctive legal development, isolated from the main currents of European thought, in America, to the exigencies of a forced legal development under primitive conditions.

But these facts, which loom large to the student of English and American conditions, must not be permitted to distort his view, of the general and permanent position of law in the scheme of higher education. Considered merely from the historical point of view, the loss of its sacred or religious character may, indeed, affect its prestige, and might conceivably relegate it to a subordinate place in the university curriculum, or even eliminate it entirely therefrom. But with the decay of the conception of law as a branch of divine science there has arisen a recognition of its controlling position among the social sciences. As the concrete expression of the aggregate of social forces which dominate the world and shape its development, it can no more be separated from other social sciences than can the will of man be isolated from the intellectual and moral qualities which set that will in motion and direct its activities. Robbed of all its attributes of divinity, law remains as the will of society expressed in action, and as such its place in the hierarchy of learning is secure.

That law has not as a university discipline suffered an eclipse during this period of transition from the old to the newer conception of its place in the divine human order is due to the fact that the transformation of opinion has been a gradual, almost an imperceptible one, the modern view coexisting with and gradually supplanting the older, a process which is still incomplete. If the great schools of law which flourished at Pavia, Ravenna, and Bologna in the twelfth and thirteenth centuries have lost their honorable preëminence, the fact is due to no failure of appreciation or of service, but only to the fact that newer foundations more richly endowed or more favorably situated have exercised a more powerful attraction on the aspiring votaries of the science. The 12,000 students enrolled under the law faculties of the German universities in the winter semester of 1911–1912 furnish convincing evidence of the permanence and importance of the law as an academic discipline. (For the history of legal education on the Continent see UNIVERSITIES: for its history in England, see INNS of COURT.)

United States. — *Place of Law in American Traditions.* — In no community of ancient or modern times has the study of the law been more general or pursued with greater avidity than in the United States. The legal character of the controversies of the American colonies with the mother country drew many of the more ardent patriots of the day to the study and practice of that profession, and gave it unexampled scope and influence. Edmund Burke, in a notable passage, attributed the spirit of resistance to aggression which the colonists displayed to their familiarity with the principles of English law. The "government of laws, not of men," which arose on the ruins of the colonial system, the institution of a federal system based on a constitutional document of a highly legal character, the assumption by the courts of the function of determining the constitutional validity of acts of legislation, all conspired to give to the lawyer and the study of law a high degree of political importance. The result has been not only to enlarge to an unprecedented degree, perhaps to exaggerate, the function of the law as an instrument of social regulation, but to attract to the profession multitudes of young men whose interest lay rather in the political than in the legal sphere of activity.

For nearly a hundred years after the settlements in New England there was no recognized law, no settled procedure, and consequently no need of lawyers. The judges were for the most part laymen, and they decided the causes brought before them on principles of "natural justice," or, in Massachusetts and Connecticut, in accordance with the "Word of God." The first code of laws of the Commonwealth of Massachusetts, prepared under authority of the General Court, or Legislature, was drawn by the Rev. John Cotton, and entitled *A Copy of Moses, his judicials, compiled in an exact method.* There were no English law books in the colonies until the Governor of the Massachusetts Bay Colony, in 1647, imported two copies of *Coke on Littleton* and half a dozen other volumes "to the end that we may have better light for making and proceeding about laws." It was more than a hundred years later that the first volume of law reports in America appeared (Kirby's *Connecticut Reports*, published in 1789), and not until 1802 that the first book of practice (*American Precedents of Declarations*) issued from the press.

Education in the Law during the Colonial Period. — Under these novel conditions — a new body of law slowly taking shape in the customs of an isolated community, a bench composed of ministers, business men, and "gentlemen" having no legal training or experience, with no reported decisions and no indigenous legal literature — it is not to be wondered at that a trained bar was long in appearing. Attorneys there were in plenty in all the colonies, but these were for the most part men of no education and of little character. The first lawyers to appear in the colonial courts were derelicts of the profession in England, and, toward the latter part of the seventeenth century, an occasional barrister of reputation whom fate had exiled from the atmosphere of the Inns of Court. Then early in the new century young Americans of good family began in increasing numbers to resort to London for an experience of Old World life, and not a few of them took advantage of the opportunities there afforded to pursue the study of law. It is significant of the spirit of the time, in England as well as in the colonies, that many of these had no professional aim, and that the law presented itself to them as a branch of polite learning suitable for gentlemen who might reasonably expect to play a prominent part in the public or social life of the time. The instruction afforded in the time-honored universities of the common law, the Inns of Court, was of an insignificant character, but the courts of law and chancery, presided over by such men as Mansfield, Kenyon, Ellenborough, Thurlow, and Eldon, and illuminated by the eloquence of Erskine, Pitt, and Camden, were their real schools and to these they resorted. There, too, were the priceless books of the law and the expanding treasures of the law reports, and these they read with an eager interest which, in this more sophisticated and heavy-laden age, we cannot easily understand. It is said that something like twoscore American-born lawyers were educated in England prior to 1760, and that 115 more were admitted to the Inns of Court (*q.v.*) between that date and the close of the Revolution — more than two thirds of them from the southern colonies.

Apart from private reading of the few accessible English books and the practice of attending court, two courses offering a more systematic training were open to the law student of the revolutionary period. He might secure a position as copyist or assistant in the clerk's office of some inferior or higher court, or, if he had the means, he might enter the office of some leading member of the bar, preferably one of the few who had good law libraries, "there absorbing, by study, observation, and, occasionally, by direct teaching from his senior, the principles of the law" (Warren, *History of the American Bar*). The latter was a method open only to young men of means, as the privilege of entering the office of a lawyer of reputation could be gained only by the payment of a considerable fee. A promissory note of George Washington is still extant, undertaking "to pay James Wilson, Esq., or order on demand one hundred guineas, his fee for receiving my nephew Bushrod Washington as a student of law in his office." The memoirs of the time show that as a method of legal instruction this system left much to be desired. The lawyer was too apt to regard the fee as compensation for entering the office and for the privilege of reading the law books or the notes and briefs of the office, and not as calling for any personal instruction or advice. In some cases, it is true, the arrangement took on the form of a free apprenticeship, the incumbent being privileged to aid in the preparation of cases and less frequently to assist in their trial. But the system must in all but the exceptional cases have been an unsatisfactory one, and the lawyer gained his education in legal principles after rather than before his admission to the bar. Indeed, even under the most favorable circumstances the education of the student must have been of the most meager character. After all, the books available were few in number, and until the appearance of Blackstone's work in 1769, were all of a highly technical character. Littleton's *Tenures* and Coke's learned but crabbed and unsystematic *Commentaries on Littleton* were the works generally recommended, and to most students they must have proved an obstacle rather than an aid to the mastery of the law. Their artificial, limited, and fragmentary character, as well as their remoteness from the actual conditions and the actual law of the colonies, rendered them peculiarly unsuitable for the use of students. To these must be added one or two books on the technical system of common law pleading of the day and, perhaps, a digest or abridgment of precedents. There was nothing in all this to give a comprehensive view of the law or to enable one to grasp it as a system or to relate it to the social life of the time. A few of the more favored students were more fortunate in the range and variety of their studies. John Adams records that he read the *Institutes of Justinian*, besides other works on Roman Law, and Chancellor Kent added to these the study of Grotius and Puffendorf, Rapin's *Dissertations on the Laws and Customs of the Anglo-Saxons*, and Sir Matthew Hale's *History of the Common Law*. Daniel Webster's reading included all the standard English books, and, in addition, the works of Vattel, Burlamaqui, and Montesquieu. But these were the exceptional men, in talent as well as in opportunity, and though, through their professional eminence, they exerted a marked influence on the course of legal development, they could do little to affect the general standard of legal education.

It is a curious and interesting result of this wide diversity of training and equipment of the lawyers of the formative period in our legal development that both groups — the half educated through their defective grounding in the principles of the common law, the highly educated through their familiarity with the writings of continental jurists of the philosophical sort — contributed to maintain for a considerable time the freedom and flexibility of American law. It was not until the bar generally as the result of a more thorough training in the common law had become indoctrinated with the spirit as well as the rules of that system, that our jurisprudence became, like that of the mother country, authoritative and inflexible. In the meantime the restricted and technical character of the education of the greater part of the bar had produced the unfortunate effect of imparting to our law a certain hard and technical character which it has never lost. Littleton and Coke and Hawkins (*Pleas of the Crown*) and Lilly (*Entries* and *Doctrina Placitanda*) were not the most desirable teachers for a new society of freemen with a new world to create. And we may safely charge to their influence the feudal survivals and the rigid and artificial legal reasoning which have done so much to hamper the free development of life in the western world.

The Influence of Blackstone. — Two events of capital importance in the history of legal education in America marked the latter part of the eighteenth century: the appearance of Blackstone's *Commentaries on the Laws of England* and the institution of systematic legal instruction in colleges and schools of law. That these two events were not unrelated will appear in the sequel. It would be difficult to exaggerate the influence of Blackstone's work on the bar or on the course of legal development in this country. Its success was instantaneous, and it became at once the favorite, if not the only, textbook of the American student. Two years after the publication of the fourth and concluding volume of the work in England it was republished in Philadelphia, and it is said that 2500 copies of the work were immediately absorbed in the colonies before the outbreak of the Revolution. Burke, in a speech delivered in 1775, to which reference has already been made, ventured the assertion that nearly as many copies of the *Commentaries* had been sold in the colonies as in England. The reasons for this success are not far to seek. The book made a varied appeal — to the sentiments as well as to the needs of the American student. Its panegyrics of Anglo-Saxon liberty and its denunciations of Norman and Stuart tyranny, however turgid and unconvincing they may seem to the reader of a later date, awakened a responsive chord in the men of that time of revolt. That the common law, instead of being the convenient instrument of despotism, was in spirit and in truth the guardian of the ancient liberties of the race, was a welcome revelation to the lay community as well as to the bar; while the legal profession acquired a new dignity as the inheritors of such a tradition, the appointed guardians of its sacred flame. The utilitarian merits of the work, as a trustworthy guide to a knowledge of the law, were not less conspicuous. Though necessarily somewhat superficial, it was upon the whole an accurate presentation of the common law and equity systems as administered in Westminster Hall. Over Coke and Littleton it had the advantage of being modern, untechnical, and readable. Its somewhat florid and balanced style did not repel the reader of the time of Gibbon and Burke, and even to-day it can, like them, be read with pleasure as well as profit. But the chief merit of the work, and that which gave it instant and complete command of the field of legal education was its comprehensiveness and its systematic character. In its pages it was possible for the first time to see the English law as a whole, and, what is more important, as a connected whole, related in all its parts and inspired by a common spirit. The law now had unity, reason, a soul, and Blackstone was its prophet. But a prophet is more than a teacher; he is also an authority; and so it came to pass that the new book of the law was received not only as an indispensable means of acquiring a knowledge of the law, but as the final and authoritative statement of its rules and principles. But in the course of time its inspiration came to be questioned. Professor William G. Hammond, perhaps the most learned of the American commentators on Blackstone, tells us in the preface to his edition of the *Commentaries* (published in 1890) that " upon all questions of private law, at least, this work stood for the law itself throughout the country, and at least for a generation to come exercised an influence upon the jurisprudence of the new nation which no other work has since enjoyed and to which no other work can possibly now attain."

But it is rather with his position as a teacher and with the indirect influence which he exerted on the development of the law as the result of forming the mind of the American bar, that we are now concerned, and here his authority was more enduring. A knowledge of Blackstone was everywhere accepted as sufficient evidence of fitness for the bar. The first effect of this was to set the law student free from the necessity of seeking a master or an office connection. There could be no need of a teacher or a library for one who had the entire body of the law within the compass of a single book, and that a readable, understandable book. It was, perhaps, to be expected that the law school, when it came, would put the *Commentaries* in its proper place, as only one of many books of the law which the student must master; but the contrary was the case. Blackstone may almost be said to have been the father of the American law school. He made it possible, and supplied it with the principal material for instruction. As an illustration of the place actually occupied by the work in the teaching of the schools it is interesting to note that a manuscript volume of the lectures delivered at the famous Litchfield Law School in Connecticut shows numerous citations of authority, but that "the references to Blackstone not only outnumber those to any other book, but may be safely said to outnumber all the rest together."

It is, of course, obvious that the swelling tide of legal literature during the past century, and, still more, the enormous expansion of the law in that period, must have seriously affected the position of Blackstone's work as the principal source of legal knowledge. Law students can no longer satisfy the demands of the bar by the easy process of reading that now venerable classic. But it is certainly no exaggeration to say that by far the greater number of the lawyers now living in this country read the *Commentaries* as an important, if not essential, part of their education for the bar; that in most cases it was the first law book placed in their hands, and that their examination for admission was, at least in part, based on it. It still forms a part of the regular work of instruction in perhaps a majority of the law schools, and is an important part of the recommended reading in nearly all of them; while, of the multitude of young men and women who still come to the bar without a law school training, it is safe to say that three fourths or more read Blackstone in whole or in part. In closing our account with the greatest single influence on education in the western world, let it be noted that we owe to it more than can be estimated in the establishment of a tradition of the unity of the law and a resultant general uniformity and consistency in the law of the several states of the American commonwealth — a priceless boon, inasmuch as it has made for national unity and social solidarity. How much of the eighteenth century that still cumbers the law of the twentieth we also owe to it, it would be vain to inquire. The fault, if fault there be, is due not to Blackstone, but to the undue persistence of the Blackstonean tradition, and for this our law schools are to blame.

Early Law Schools, in America. — It is a disappointment to discover that legal education does not enter upon a new phase with the advent of the law school. Originating as it did, it was of course devoid of any academic tradition. The great European schools of jurisprudence had scarcely a name in America. The civil law was an alien, and, to the average lawyer, an abhorrent system, bound up in some mysterious way with popery and the imperialistic system of the Continent. It is true that sporadic efforts were made in some of the colleges (at King's College in New York, now Columbia University, in 1773, at the College of William and Mary in Virginia in 1779, at Yale College in Connecticut in 1789, and at the College of New Jersey, now Princeton University, in 1795) to maintain courses of lectures in the law of nature, international law, and the civil law, but these were feeble beginnings, born out of time, and came to nothing. The systematic teaching of the law was to come from the profession, not from the universities, and was to be born of the failure of the apprenticeship system, not of the scientific or historical spirit. Indeed, it could not be otherwise. As has elsewhere been said, academic instruction presupposes a body of organized knowledge, and that was lacking in the law of the period with which we are dealing. There was as yet no system — not even a coherent body — of American law. The common law, then and now a half foreign thing, had indeed grown to be a well articulated, developed system of law; but it had never been rationalized, systematized, and related to other legal systems or to ethics and the social sciences. There was an English law, but no English jurisprudence. Accordingly, neither in England nor in this country was it possible to teach the law of the land philosophically or systematically. The result was that, as soon as the instructor undertook to teach the law as a connected whole, he found himself teaching a single book — Blackstone's *Commentaries*. Now, no system of academic instruction can be based on a single book, however epoch-making. Even the sacred books of the race had to be developed by glossators into a literature before they became fitted for this purpose.

Perhaps the most interesting attempt to make the law a subject of academic instruction at this period was made at Columbia College. As early as 1784 the trustees of the college voted to establish a law school with three professorships, viz.: "A professorship in the Law of Nature and Nations, a professorship in the Roman Civil Law, a professorship in the Municipal Law." Lack of means prevented the carrying out of this ambitious project, but in 1793 it was found possible to make a beginning, and James Kent was appointed to the first regular law professorship. This brilliant young man, then at the threshold of his long and distinguished career, took up his duties with energy and in a true scholarly and scientific spirit. His was a noble aim, but was not destined to be realized. In his first course, given in the fall of 1794, he "was honored," he notes, "by the attendance throughout the course of seven students and thirty-six gentlemen, chiefly lawyers and law students, who did not belong to the college." The next year he gave a more extended course to two students and his own clerk. No students presenting themselves for the third year, he tendered his resignation, which was accepted in April, 1793. In 1823, after twenty-five years of distinguished public service as judge, chief justice and chancellor of the state of New York, he resumed his chair at Columbia, which had in the meantime remained unoccupied. The fame which he brought back with him and the growing importance of New York as a legal center drew to his lectures more students than had been attracted to his previous venture; but he soon wearied of the unaccustomed labor, and, after three years of service, again resigned his chair. But the service of these years was not confined to the influence that the lecturer exerted on the few students who came under his immediate instruction, for they resulted in the production of the first systematic treatise on American law and one which was destined to hold that distinguished place to the end of the century. It was in 1826 and 1827 that Kent embodied in printed form the lectures which he had delivered during his second incumbency of the professorship in Columbia College under the title *Commentaries on American Law.* While this work of the American jurist did not take the legal profession by storm, as that of the great English commentator had done, and while it never took the place of the latter as the favorite textbook for students, it had, nevertheless, an instantaneous and permanent success. Though less systematic and less comprehensive than Blackstone's work, it was at once accepted as a clear, learned, and accurate exposition of the law of the land. As the only work which purported to cover the field of American law, it became the indispensable adjunct of the English work, and its graceful style commended it to the lay reader as well as to the legal profession. The permanence of its influence may be gauged from the fact that it has passed through fourteen editions (the last published in 1896), and that it is still deemed a necessary part of every well equipped law library and is still frequently cited in the courts throughout the nation. It is significant of the rapid growth of a consistent native jurisprudence under the influences above described that, by the end of the first quarter of the century, only forty years after the Revolution, a treatise on American law of a fairly comprehensive and systematic character should have become possible. The foundations of an American legal education were beginning to appear — a consistent body of national law and a legal literature.

The first of the schools which were destined to become the characteristic note of American legal education was founded in 1784 at Litchfield, Conn., by Tapping Reeve, a learned lawyer, who afterwards became Chief Justice of the Superior Court of Connecticut. It had a brilliant career of thirty-five years, in the course of which it educated over a thousand young men for the bar and carried on its rolls the names of many men who afterwards became famous in political and professional life. Its influence may be measured by the fact that it drew its students from all parts of the country from Maine to Ohio. President Timothy Dwight of Yale College gives a favorable view of the character of the instruction imparted in the school, saying, "Law is here taught as a science, and not merely nor principally as a mechanical business; not as a collection of loose, independent fragments, but as a regular, well-compacted system." This was written in or about 1820, when the school numbered 40 students and was at the height of its influence. It was probably to the rapid rise of the Harvard Law School after 1830 that the decay of the Litchfield school was due. The New England of that day was incapable of supporting more than a single flourishing school of law. The Harvard School, founded in 1817, led a precarious existence until the establishment of the Dane Professorship in 1830. This rendered it possible to secure the services of Joseph Story, then a justice of the United States Supreme Court, whose fame, with that of his distinguished colleagues, John Hooker Ashmun and Simon Greenleaf, attracted students from all parts of the country, and soon made the Harvard institution the leading law school in the United States. In the meantime several other schools of temporary fame and of varying influence, perhaps a dozen in all, had come into existence and passed away. These were all small, and made little or no mark on their time.. One of the most famous of these, founded by Judge Samuel Howe at Northampton, Mass., is recorded as having "flourished from 1823 to 1829, with a yearly average attendance of ten students." Well might the learned David Hoffman of Maryland say of this period, "In America alone a law student was left to his own insulated and unassisted efforts." The comment of the author of *A History of the American Bar*, that "the legal profession had not yet fully accepted the idea that law could be learned in a law school as well as in a law office" was to hold good for a long time to come.

The character of the instruction given in the schools of this period varied only with the genius and temperament of the instructor. So far as the scanty records of the time show, the methods employed were much the same in all. Generally Blackstone's *Commentaries* was placed in the hands of the students and furnished the basis of instruction in the law as the "regular, well-compacted system" described by President Dwight. This was supplemented by courses of formal lectures on the several branches of the law as administered in the United States, by weekly or more frequent "quizzes" on Blackstone and on the lectures previously given, and by "moot courts," usually conducted by the instructors. In some instances, as at Litchfield, the whole ground, including the substance of Blackstone, was covered in lectures, which the students were expected to commit to writing. St. George Tucker, an eminent lawyer of Virginia, made his lectures on Blackstone, delivered at William and Mary College, the basis of a well-known edition of the *Commentaries*, published in 1803. The instruction in all of the schools was of a strictly professional and utilitarian character, confined to the law which the student might expect to encounter in his subsequent practice, and included no legal history, general jurisprudence, or civil law. Occasionally international law found a place in the curriculum, and the momentous constitutional decisions of the time were commented on and discussed. Such was the American law school of the period of national expansion, and such it continued to be, in method and in spirit, almost to the end of the century.

The Nineteenth Century Law School Development. — But the law school movement was now on. Between 1830 and 1860 numberless schools of the general character of those described above sprang into existence, many of which proved to be permanent. Among these were several of the university foundations which have since become deservedly famous, such as the Law School of Yale College in New Haven, established in 1843, that of the University of Pennsylvania at Philadelphia, in 1852, of the University of Michigan at Ann Arbor in 1859, and, in the same year, the Union College of Law of Chicago, which later became the Law School of Northwestern University and the Columbia Law School in the City of New York. There are no statistics available for this period, but the *Report* of the Commissioner of Education for 1871 lists forty law schools as in existence at that date, with a total enrollment of 1722 students. As only one of these was without a university connection, it is obvious that the record is incomplete. There must have been a considerable number of private schools of the type of the Albany Law School (founded in 1851), maintained to satisfy a local need, which failed to attract the notice of the Bureau of Education. This is, perhaps, the explanation of the fact that no law schools are reported for seventeen of the thirty-seven states which then comprised the Union. The number of students was usually small, eight schools having less than a dozen each, and fourteen having twenty-five or less. Only four of the total number had more than 100 students in attendance, the Michigan Law School, which had already assumed the preëminence which it was long to retain in the West, leading with 321.

But the movement for systematic instruction in the law had not yet gained the momentum which it was soon to acquire. During the decade from 1870 to 1880 only seven new law schools are reported, though the number of students had risen to 3227. By 1890 the number of schools had increased to fifty-four, with 5252 students. There were now eighteen schools with an attendance of 100 and upwards, the Columbia Law School leading with 625 students and Michigan a good second with 587. The Harvard Law School, which, under the administration of Professor C. C. Langdell, had already entered upon the career which was to make her for a generation the undisputed leader in legal education, had at that time 279 students enrolled. But the period of expansion had now come. The increasing volume and complexity of the law combined with the new and more exacting demands of the profession to demonstrate the inadequacy of the apprenticeship system, if such it can be called, and students flocked in increasing numbers to the existing law schools and demanded new ones. In the decade from 1890 to 1900 the number of law schools nearly doubled (there were now 100), and the number of students increased 160 per cent.

The demand for new centers of legal instruction must have been pretty well satisfied for the time being by the multiplication of schools in the last decade of the century, as only fourteen new law schools have since come into existence. But the swarm of students continues. The 13,642 of 1900 had in 1910 become 19,567, an increase of nearly 50 per cent. The growth in influence of the leading schools is attested by the fact that no less than sixty-five have to-day over 100 students each, that thirty-eight have an enrollment of over 200 each, eighteen of 300 and upwards, and ten of more than 400. The latest available reports give the Michigan Law School a student body of 897, Harvard of 810, the New York Law School of 763, the New York University of 688, and Columbia of 465. Two thousand students are enrolled in the law schools of Chicago, and 2500 in those of New York City.

Impressive as these figures are, it would be easy to exaggerate their significance. They do not indicate that the American lawyer has even yet fully accepted the idea that the law school is a better place then the law office for acquiring a knowledge of the principles of the law, but only that that idea is making its way in the profession. It is safe to say that even to-day not less than two thirds of those who apply for admission to the bar have gained their professional training wholly or mainly in law offices. Nowhere in the United States is attendance at a law school a prerequisite to admission to the bar. The tradition that law, being an art and not a science (for so the tradition runs), can best be acquired in the legal workshop survives with the notion that every free American, who is a male of full age and not yet convicted of crime, is entitled to make his living by practicing law as well as in any other art or craft. Both these traditions have still enough of vitality in them to hamper the course of legal education, but both are slowly yielding to the pressure of the time.

The same conditions which were driving law students in increasing numbers into the law schools conspired to make the schools more exacting in their demands upon the students who resorted to them. These demands took on two forms — the requirement of a better general education and the raising of the standards of instruction. Down to the middle of the last century students were generally admitted to the schools without examination and without any close scrutiny of their qualifications for the study of the law. The first announcement of the Columbia Law School, published in 1859, provides that "Any person of good moral character whether a graduate of a college or not, may be admitted to either of the classes. No examination and no particular course of previous study is required for admission." It was not until 1876 that the additional requirement was made that the candidate "must be at least eighteen years of age and have received a good academic education, including such a knowledge of the Latin language as is required for admission to the Freshman Class of this College" — a standard which has now come to be general in the law schools of the country. Two influences, emanating from the profession have contributed to this result — persistent pressure from the American Bar Association (which, at its creation in 1878 had provided for a Committee on Legal Education) and the general adoption by the courts of rules for admission to the bar prescribing a minimum of previous academic training for all candidates. Probably the demand of the legal profession on the law schools would have gone no further had it not been for an impulse communicated by the universities.

It is significant of the movement of higher education in America that the law schools have almost from the beginning been university foundations. Of the 114 schools reported for the year 1910, only 20 are without a university connection. It is true that the relationship is in many instances only nominal, but even in such cases it tends to become real. Though for reasons elsewhere given the influence of the university spirit upon the law department has been slow in asserting itself, it is making itself felt in increasing measure. It is from this source that there has come a persistent and wide-felt pressure for a better preliminary education for law students. Harvard led off in 1897 by instituting the requirement of a college degree for admission to the law school of the university. Columbia followed with the same requirement six years later, but has since modified it in favor of a three years' college course. The movement has gone on steadily, and is still in progress. While Harvard is still alone in requiring a college degree, at least six law schools now require three years, ten or twelve require two years, and a dozen or fifteen one year of college study as a prerequisite to admission.

Coincidently with this development there has been a marked increase in the length of the law school course. The earlier schools seldom gave more than a year's instruction, but by the year 1880 thirty eight of the forty eight schools then in existence reported a two years' course. Of the 114 schools reported in 1910, only two confess to a course of one year, thirty four having a course of two years and seventy eight of three years. One of the most powerful influences in bringing about this rapid development of the law school course from two years to three was the Association of American Law Schools, organized by a group of representatives of the leading schools of the country in 1900, which after the year 1908 restricted membership in the Association to schools having a course of not less than three years leading to the first professional degree.

But the circumstance that has contributed most powerfully to the lengthening of the law school course, and one which is still operating, has been the general introduction into the schools of new methods of instruction involving a large increase in the time required to cover the ordinary subjects of the legal curriculum. Doubtless the "case system" of legal instruction would have come sooner or later in any event (it is at least as old as the common law); but its introduction at the critical period of legal education in America, which has been described above, was due to the genius of Professor C. C. Langdell of Harvard, who introduced it as the basis of instruction in that school when he assumed the position of dean in 1870. Based on the sound assumption that a system of law which has been developed by reported judicial decisions can best be studied in and through those decisions rather than in the writings of commentators and editors, the new method soon became a leaven which was in a short time to leaven the whole lump of legal education in this country. Properly employed, it became a powerful means of stimulating the interest of the student, and to the admirable use made of it at Harvard is to be attributed the second rise to greatness of that venerable seat of legal learning. Harvard found her first disciple in the Albany Law School, which adopted the "case system" in 1889, and in 1890 it was introduced in the Columbia Law School. Its progress since that date has been rapid, and it is now employed in a considerable majority of the law schools of the country.

The material equipment of the law schools has kept pace with their growth in size and in the intellectual graces. Most of them have separate buildings devoted to their use, and, though some are still sadly deficient in library facilities, many of them have large and rapidly growing collections of law books. Twenty only are without libraries of their own, though these usually have access to the collections of state or county libraries. Thirty two more have less than 2000 volumes, but forty have libraries of 5000 and upwards, twenty four of more than 10,000, ten of more than 20,000, and eight of more than 30,000. The Harvard Law Library, one of the most complete in the world, contains 125,000 volumes.

It is in the persistently professional character of the law school that we find the chief source of its strength and of its weakness. Created by the profession and, for the most part, even in the university schools, controlled by it, it has kept in close touch with the administration of the law, and has thus been preserved from assuming too much of an academic character. The instruction, still for the most part given by lawyers in active practice, has been of the most concrete, practical character. In many of the schools the hours of instruction are still arranged with a view to permitting the students to carry on their work in law offices at the same time, and it is safe to say that a majority of the students in the law schools avail themselves of the opportunity so to do. This practice has not only militated against the influence of the law school as a seat of legal learning, but has put a premium on methods of instruction which made the least possible demand on the time and energy of the student. Even in schools in which this practice does not obtain, the professional influence has generally been thrown against legal studies of a general or "theoretical" character and against methods involving research. The result is that even to-day the curriculum of the law school seldom includes any subjects except those required for the bar examinations, and these comprehend nothing but those branches of the law which the lawyer is apt to require in his daily practice. Consequently few of the schools have deemed it necessary or proper to offer courses in the civil law, in legal history (even in the history of our own legal system), in general jurisprudence, or even in public law, other than the law of the federal constitution. Even when they are given, such studies are usually regarded as "frills" or "extras," and are apt to be relegated to an additional, postgraduate course which is rarely taken. A few schools, like those of Columbia, Northwestern, and now, perhaps, Harvard, must be excepted from this condemnation, a liberalizing influence, coming from a school of political science or a department of history or economics, having to a degree leavened the professional tradition in those institutions. The statement of the Committee on Legal Education of the American Bar Association contained in its Report of 1892 is as true of conditions to-day as it was of those twenty years ago. "It is evident that the course of study in the schools is, with a very few exceptions, confined to the branches of practical private law which a student finds of use in the first years of his practice. It is the technical rather than the scientific or philosophic view of law which is taught."

England. — In England the house of the law has always been divided against itself. Even yet there is no promise there of that fusion of theory and practice, of academic with technical training, which the universities, through their control of professional education, are promising us in America. We may or we may not believe that the celebrated Lombard jurist Vacarius taught at Oxford in the middle of the twelfth century (the evidence is far from convincing), but certain it is that the study of that Romanized Roman law, which we call the canon law, flourished at both Oxford and Cambridge from an early period until prohibited by Henry VIII, and that the study of the civil law, of almost equal antiquity, was by the same monarch encouraged by the foundation of professorships at both universities. At the time when the Roman law was sweeping everything before it on the Continent, its study was pursued with enthusiasm in England, and there were not wanting those who anticipated a similar triumph for it over the barbarous English law. But the common law was a self-made, independent old body, with a way of its own. The creation of lawyers, who saw nothing good in anything of foreign origin and nothing but evil in anything Roman, it was intrenched in the Inns of Court (*q.v.*), where the members of the bar and their students lived and studied and disputed over the cases in the Year Books together. Thus in England, as later in America, legal education was the work of the active bar, and it is to this fact that Maitland (*English Law and the Renaissance*) attributed that "toughness" of the common law which enabled it to resist and defeat the Romanizing influences emanating from the universities. From that day to this the two streams of legal learning have flowed on without mingling — from the universities, the stream of legal science, philosophy, and history; from the Inns of Court, the stream of practical training which should fit men for the actual work of the bar. Sir John Fortescue, Chief Justice of the King's Bench in the reign of Henry VI, in his treatise *De Laudibus Legum Angliae*, raises the question "Why the laws of England, being so good, so fruitfull and so commodious, are not taught at the universities, as the Civill and Canon Lawes are," and he answers it, not very convincingly, by saying, "In the universities of England sciences are not taught but in the Latin tongue; and the lawes of the land are to be learned in three several tongues: towitte, in the English tongue, the French tongue and the Latin tongue. . . . Wherefore, while the lawes of England are learned in these three tongues, they cannot conveniently be studied in the universities where only the Latin tongue is exercised." Doubtless the real reason is to be found in the learned Chief Justice's further statement that "the same Lawes are taught and learned, in a certaine place of publique or common studie, more convenient and apt for attayning of them than any other University. For this place of studie is situate nie to the King's Courts, where the same lawes are pleaded and argued and judgements by the same given by Judges, men of gravitie, ancient in years, perfit and graduate in the same lawes. Wherefore, every day in Court, the students in those Lawes resort by great numbers into those Courts wherein the same lawes are read and taught as it were in common scholes."

The reference is to the Inns of Chancery and the more famous Inns of Court, which together constituted at that period "as it were an university or school of all commendable qualities requisite for noblemen," the charges being so high that "the children onely of Noble men doe studie the Lawes in those Inns." A later writer, Joseph Walton, Esq., Q.C. in a paper read before the American Bar Association in 1899, speaking of the great activity of corporate life which the Inns displayed during the sixteenth and early seventeenth centuries, says, "The education of the students was not left in the hands of salaried teachers, but the Benchers (the governing body of the Inns) and the Bar alike coöperated in the work." The fact that then as now no man could practice at the English bar unless he had been admitted as a student at one of the Inns of Court and had been in residence the prescribed number of terms furnishes the final and convincing answer to the question propounded by Sir John Fortescue.

But the Inns were to fall upon evil days. As we have learned in America, instruction by "salaried teachers" has some advantages over that imparted by busy members of the profession, and so it came to pass that the bar, which had created the system of legal education, through neglect destroyed its own offspring. By 1688 it was possible for Roger North to say: "Of all the professions in the world, that pretend to book learning, none is so destitute of institution as that of the Common Law. Academick studies, which take in that of the civil law, have tutors and professors to aid them, and the students are entertained in colleges under a discipline, in the midst of societies, that are, or should be, devoted to study; which encourages, as well as demonstrates, such methods in general as everyone may easily apply to his own particular use. But for the Common Law, however, there are societies which have the outward show or pretense of Collegiate Institution, yet in reality nothing of that sort is now to be found in them; and whereas in more ancient times there were exercises used in the Hall, they were more for probation than for institution; now even those are shrunk into mere form, and that preserved only for conformity to rules, that gentlemen by tale of appearances in exercises rather than by any sort of performances, might be entitled to be called to the Bar."

After the abdication of its teaching function the corporate bar left the students to their own devices. The "lawes of England" were not taught in the universities, and thus the system of an office apprenticeship grew up, the student becoming a pupil for two or three years in the chambers of a conveyancer, equity draftsman, or special pleader. The requirement of twelve terms (three years) of residence in the Inns of Court was satisfied by the eating of a certain number of dinners in the Hall. This was the state of legal education in England from the middle of the seventeenth to nearly the middle of the nineteenth century, when (in 1832) the great Society of Attorneys and Solicitors was formed, for the purpose, among other things, of providing for the education of its branch of the profession, and when (in 1840) the Benchers of the four Inns of Court established the Council of Legal Education.

The modern period of legal education in England coincides pretty nearly with what may be called the second period in the development of the law school in the United States, dating from about the year 1860. There, as here, it was due not to an awakening of the universities to a sense of their duty to the community, but to a conscious effort of the profession to secure a better equipment for the discharge of its increasing responsibilities. It is true that the teaching of English law was introduced at Oxford as far back as 1754, when Sir William Blackstone delivered his famous lectures there; but the experiment attracted no professional students, and exerted no direct influence on legal education. It was not until the movement inaugurated by the Incorporated Law Society and the Council of Legal Education of the Inns of Court had gained considerable momentum that the universities awoke from their lethargy and established what may be called schools of law. These include, besides the venerable studies in the Roman law, upon which the chief emphasis is still placed, courses in general jurisprudence, English constitutional law and history, international law, and in the principal topics of English law. Apparently these attract but few candidates for the bar, and the legal profession, as of old, pursues its own course. The character of the instruction provided by the latter is largely determined by the time-honored division of the professional field between the two distinct orders of solicitors and barristers. The honorable societies which constitute the four Inns of Court are gilds of barristers, and the education provided by them is confined to candidates for the bar in the restricted English sense of that term. It was to meet the demand for more systematic training for the neglected solicitor's clerk that the Incorporated Law Society (now the Law Society of the United Kingdom) has instituted examinations to test the proficiency of students in the principles of law and procedure. Quite recently the society has also opened some courses of instruction. Meanwhile in the Inns of Court the potential barrister may, if he so desires, pursue courses of lectures in the whole field of English law as well as in Roman law, jurisprudence, and international law. But he is not required to do so, and it is reported that he seldom does. The new university foundations in London, and several of the provincial centers — Manchester, Liverpool, Leeds, and Sheffield — have also set themselves, somewhat feebly as yet, to the teaching of the law of the land.

The looseness and lack of consistency of the scheme of legal education in England renders it a difficult task to describe it as a whole, or to characterize it fairly. It seems as yet to be without form and void. The two older universities are still out of the current of professional influence. Their emphasis is still on the law of the dead past rather than of the living present, and they have not sought to establish any relation between the two. Their courses in English law are too general in character to be of much use to the professional student, and it is doubtful if he would avail himself of them if they were perfectly adapted to his purpose. The tradition of the bar still strongly favors a " practical " education, obtained principally in a law office, with enough reading of the standard textbooks to enable the student to pass the prescribed examinations. As it is of no particular advantage to him to attend law lectures, he is in general content to do without them. It is reported that the total number of law students registered in the universities and the Inns of Court does not exceed 2000, a much smaller number than the Inns alone harbored in the sixteenth century. The lectures in the Inns, like those in the universities, are for the most part of the didactic sort, often consisting of dictation. The " case method," which is revolutionizing the teaching of law in America, is spoken of with respect, but is nowhere employed. It may be added that there is no uniform standard of preliminary education for law students, that the courses of instruction are short, — not more than a year being devoted to the English law in most schools, — and that, excepting in the older universities, the instruction is for the most part given by members of the active bar. The only " system " that can be detected is the system of examinations. These are substantially the same in all the universities, in the Inns of Court, and in the Law Society, and are said to be of a rigorous character.

It is apparent that much remains to be done to make the legal education of England the efficient instrument of legal progress that the times demand. But we are told that there is much ground for encouragement; that the bar is awakening to the need of reform, that the universities and Inns are feeling the influence of the American renaissance of the last two decades, and that a new Society of Public Teachers of Law in England and Wales has recently been formed to organize and push forward the work of legal education in the mother country of the common law. As Professor Hazeltine of Cambridge says, " These are happy auguries for the future."

The Continent of Europe. — The American law school has for more than fifty years held the admiration of the profession in England, and has received unstinted praise from the leaders of that kindred bar — a fact which a comparison between the conditions of legal education in the two countries serves to explain. But no such acclaim comes from Continental jurists. For them the American system, even at its best, falls lamentably short of that ideal of sound scholarship which informs the legal education of the Continental countries of western Europe. As the inheritors of a tradition of world law, which was itself only the expression of natural law, a law written in the constitution of man, the jurists of Europe cannot regard the study of any isolated legal system, however developed and complete in itself, as in any proper sense a scientific performance. To the French or the German student, who regards his polity as only a fragment of a world order, the self-contained, self-satisfied attitude of the English and American lawyer seems narrow and provincial. It would be as reasonable, as scientific, to study the institution of the family without reference to the society of which it forms a part as to study the law of a given community without reference to the general law. Hence the Continental student refuses to be impressed with our claim that by making the study of the cases the basis of legal instruction we have made our teaching of the law scientific. He answers that a scientific method does not of itself make a science. He insists that the content of a subject of study is as important as the method of investigation employed upon it, and that until we have, through a new birth of scholarship, related our law to that of the rest of the civilized world, past and present, and to the ethical and social sciences, we shall never have a legal education worthy of the name.

This description of the conditions which have formed the ideal of legal scholarship on the Continent and determined the character of the legal education which there prevails points back of the universities to an order of ideas of which they are in part the fruit and in part the preservers. As his law was the law of imperial Rome, the Continental lawyer, had there been no universities, could not have failed to conceive of the law that he was called upon to administer as only a part of the general European law. The law student acquired a knowledge of his own law through the study of the Roman law. But here the university was a necessary instrumentality. The law to be learned was not an indigenous common law, as in England, but a system handed down and "received," set forth in a language which only the learned know, and expounded in writings of great erudition which only the learned could interpret and expound. And thus, as the only depository of this learning and of the texts and other material on which it was based, the university became the seat of legal instruction. Its instruction was arid enough at first — the scholastic interpretation of the inspired texts and of the scarcely less inspired gloss which encrusted it. But with the Renaissance a new spirit entered into the teaching of law, as into every other department of university education, and it was broadened and enriched by the study of philosophy and of general principles of jurisprudence. But it was not until the nineteenth century that the despised local law came to be accounted worthy of a place in the university curriculum, and not until the last quarter of the century that it was received as of equal worth and dignity with the Roman law. The new value which, under the reviving spirit of nationalism, has been put on the local common law in all continental countries and especially in Germany has contributed powerfully to this result.

Germany. — But the European universities are not only the recognized seats of legal learning; they are also, through their relations to the government, the official gateways to the public service. Through them and in no other way is admittance gained to the bench, the bar, the high offices of state. This is preeminently true of the universities of Germany, which have long enjoyed the monopoly, and it is not too much to say that they have fairly earned it, through the combined practical and scientific character of the education afforded by them. The student matriculates at the university at the age of eighteen or nineteen on the completion of his course in the secondary school (*Gymnasium*). His studies, which cover the whole range of German as well as Roman law, include also international law, the philosophy of law, comparative jurisprudence, general and German legal history, and political science, and can usually be completed in three years. The instruction is mainly by lectures, with little or no discussion, though these are supplemented by seminars and *practica* for the more advanced and ambitious students. The lectures and other exercises are admittedly of a thoroughly scientific character, involving at every stage the consideration of principles of a general and fundamental character. The student is encouraged to avail himself of the courses in philosophy (including ethics), logic, economics, and sociology given under the auspices of the faculty of philosophy, and it is said that few of them neglect to do so. On the completion of his course the student is subjected to a rigorous examination covering all the work done by him. If he is a candidate for the doctor's degree, he submits a dissertation on some topic in the law to which he has given special attention.

The course of "theoretical" instruction here outlined is the same for all law students, but there is a further course of "practical" instruction which varies more or less according to the career which the *referendar*, or graduate, intends to pursue. It will be borne in mind that in Germany the law is studied not only as a preparation for legal practice, but for the bench (there a separate profession) and for other branches of the public service. To confine our attention to the bench and bar, it may be said that the candidate for the latter is required to spend not less than four years, and the candidate for the former from eight to nine years, in the service of the state; as an *assessor* or assistant in the courts and in other legal positions, always under supervision and instruction, at the end of which time he again submits himself to an examination to test his fitness for the service for which he offers himself. Then and not until then is the systematic legal education complete.

France. — The uniformity which, combined with a wide range of freedom in the election of courses and instructors, characterizes the system of university instruction in law in Germany, is lacking in the French universities. The system which there obtains is one of great flexibility, adapting itself to that one of the half dozen or more branches of the legal profession which the student proposes to enter. Nevertheless, as all but a comparatively small number pursue the complete course of study leading to the degree of licentiate in law (*licence en droit*), the more restricted courses which prepare for the lower grades of the profession, (*avoués*, notaries, and *huissiers*) may be neglected. The student who aspires to become an *avocat* or magistrate, or, indeed, to enter any of the higher grades of the public service, matriculates at the university, as in Germany, on the completion of his course in the *lycée* or secondary school. He is a year or two younger than the German student, but is more serious-minded and wastes little or no time in getting down to work. The character as well as the scope of the instruction imparted is well expressed in a paper on "The Teaching of the Law in France," read by Thomas Barclay of the French bar, before the American Bar Association in 1899. The teaching of the professors (of whom there are thirty eight in the law faculty of Paris), he tells us, "is distributed with a view to enable the student to take the degree of *licence en droit* at the termination of an ordinary three years' course of university study. There is an examination at the end of each year, and no student for the degree of *licence* can enter for either of the three examinations out of their prescribed order.

" The subjects of the first year's study are as follows: *Roman law* — the lectures on this subject embrace the whole of the legal institutions of Rome, with a view to initiating the student into the part which history plays in the development of law. *History of French civil and constitutional law* — here the idea is to awaken in the student that interest in tradition, and at the same time that critical understanding of laws by reference to their origin, which will bring him to respect their character without making him a slave to their form.

" In the same order of ideas there is a course of lectures for the first year's student in *Political Economy,* treated with regard to the current development of legislation, on the assumption that he will be enabled to understand a law better if he sees the reason for it. Lastly is included about one third of the contents of the *Civil Code* in which the lecturer endeavors again to explain why the law is as it is, and, as far as possible, to connect its provisions with the ethical basis upon which it rests.

" The second year's study includes another one third approximately of the matters treated in the Civil Code. The study of Roman law continues, but in this year it is treated with special reference to what contemporary French law has borrowed from it. In this year also the student must attend lectures on *criminal law, administrative law,* and public *international law.*

" In the third year he takes the remaining one third of the contents of the *civil code,* and *commercial law, private international law* and *civil procedure.*"

Though this university training, culminating in the *licence en droit,* is a necessary stage in the evolution of the French lawyer, he is not entitled to call himself an *avocat* or to practice as such in the higher courts until he has also devoted three years to " assiduous attendance at the hearings in court " and has carried on practical work and discussions under the direction of the " Order of Advocates."

Other Countries. — The legal instruction in other continental universities does not differ in important respects from that given in Germany and France. In some more attention is paid to the philosophy of law and to general and comparative jurisprudence than in others, and in the universities of Austria and Italy to economic history and theory, to social legislation or to ecclesiastical law, but the spirit which animates them is everywhere the same. Law is treated as a branch of social science, having its roots in ethics and in the history of civilization, and accordingly as a true university discipline to be studied in the spirit of scholarship and science. The only conspicuous defect in the continental scheme of legal education is its complete neglect of that great system of the common law which divides the hegemony of the western world with the Roman law.

G. W. K.

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LAW, WILLIAM (1686–1781). — English divine and mystic; born near Stamford in Northamptonshire. He graduated at Cambridge in 1705, and was ordained in 1711. Owing to his Jacobite views, he was deprived of his degrees in 1713. As a non-juror he was excluded from preferments in the Church. Law was a prolific writer in the field of theology, and for one work, *Christian Perfection,* he received a gift of £1000, with which he founded a school for girls at King's Cliffe. In 1745, through the help of the widow of one of his admirers and a friend, he founded a school for boys and almshouses at King's Cliffe. Law and his two friends lived as nearly as possible according to the principles laid down in his most important work, *A Serious Call to a Devout and Holy Life* (1728). Here he devotes some chapters to education, and attacks the prevailing system as tending to pride, vainglory, and ambition. The only basis of education is Christianity; hence humility and meekness are its ends. The method accordingly should be the study of the experiences of men who have led Christian lives. In the same way girls should not be trained up to value nothing but personal beauty; rather should they learn to live for their own sakes and the service of God. And it was along these lines that the *Rules to be observed by Girls* at the King's Cliffe School were drawn up. While Law's works have been neglected, his influence may be measured by the work of the Wesleys, Whitefield, and other evangelical leaders who frequently visited him.

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LAWN TENNIS. — This game is very modern in its present form, though it had its prototypes in comparatively distant ages. There are records showing that crude games of the lawn tennis type were played in Italy and in France several hundreds of years ago. One of these crude games, *la longue paume* of the French, was carried to England, and was probably the forerunner of modern lawn tennis. In 1874 Major Wingfield introduced a game under the name of *sphairistike*, which was gradually modified and the name changed to lawn tennis, and in 1877 definite rules were drawn up and the first championship contest held. Since 1877 lawn tennis has spread throughout England, the British colonies, America, France, — everywhere, in fact, where two or three Englishmen are gathered together.

The reasons for the great popularity of this game are many. It requires but a small piece of level ground; it is adapted to both sexes, all ages, and various degrees of strength; it is intensely interesting; it may be played by two, three, or four persons; and, like croquet and golf, it is a distinctly social game. One of the most difficult problems in physical education is to teach students in our schools and colleges forms of exercise which may be kept up after graduation. Lawn tennis fulfills this condition in a larger measure than any other game or sport. The popularity of lawn tennis is attested by the fact that it is the most widespread game in the colleges and secondary schools of the United States; 97.6 per cent of the colleges have from one to fifty-two tennis courts.

A tennis court may be laid out on a smooth lawn or a surface of clay and gravel. The dimensions for a single court (for two players) are 27 by 78 feet; a double court (for three or four players) is 36 by 78 feet. It is necessary to have at least 8 feet clear on each side and 20 feet at each end. The directions for laying out tennis courts, the rules of the game, and other kinds of information concerning the conduct of tournaments, etc., are described in detail in the *Lawn Tennis Guide*, published annually (Boston, Mass).

G. L. M.

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LAWRENCE COLLEGE, APPLETON, WIS. — A coeducational institution founded in 1848 as an academy, with the title Lawrence Institute. In 1849 the title was changed to Lawrence University, and in 1908 to Lawrence College. Collegiate music, expression, and art departments are maintained. The entrance requirements are fifteen units. The college offers a four-year course leading to the degree of A.B. A pre-engineering course fitting students to continue a professional course at the University of Wisconsin is also offered. There is a faculty of forty-three members. The enrollment of students in 1911–1912 was 450 in the college.

LAWS, SCHOOL. — See LEGISLATION, EDUCATIONAL; SCHOOL LAWS AND DECISIONS.

LEACH, DANIEL (1806–1891). — School superintendent and textbook author; born at Bridgewater, Mass. He received his secondary school training at the Bridgewater Academy, and was graduated from Brown University in 1830. For several years he taught in the public schools. For ten years (1838–1848) he was principal of the Classical High School at Roxbury (Boston). From 1848 to 1855 he was one of the agents (supervisors) of the State Board of Education of Massachusetts; and from 1855 to 1884 he was city superintendent of the schools of Providence, R.I. He was active in the educational associations of New England, and was a frequent contributor to educational journals. He published three textbooks — an arithmetic, a spelling book, and a geography.

W. S. M.

LEANDER CLARK COLLEGE, TOLEDO, IA. — A coeducational institution founded in 1856 under the auspices of the United Brethren Church at Shueyville and moved to its present location in 1881. It maintains an academy, college of liberal arts, teachers' course, music, business, elocution, and fine arts courses. The entrance requirements are about fourteen units. The college confers the A.B., A.M., and M.S., the two latter on completion of a year's residence and the presentation of a thesis. In 1910–1911 the enrollment was 262 students, of which 78 were in the college. The faculty consists of eighteen members.

LEARNED SOCIETIES. — See ACADEMIES; INSTITUT DE FRANCE; SCIENTIFIC SOCIETIES; GERMANY, EDUCATION IN; and articles on other national systems.

LEARNING. — The process whereby experiences are gained which function effectively in meeting new situations. This process may take many different forms, and what is popularly called learning is usually a complex process involving many of these forms. All learning presupposes on the part of the learner a stock of innate dispositions and instinctive tendencies which are the foundation for all acquired responses.

The simplest type of learning is the formation and development of perceptual processes. The stimulation of the sense organs is both logically and genetically the beginning of the learning process. Such stimulation leads to the organization of perceptual experiences. The importance of building upon such a concrete foundation has been frequently emphasized in educational theories, but there is always a tendency to fall back upon the symbolic and formal without a sufficient concrete perceptual basis. True perceptual development demands much more than mere presentation of the objects of the external world to the pupil. It cannot be taken for granted that children will recognize the true character of objects thus presented. Perceptual development demands the careful analysis of objects into their elements through observation and the fusion of these elements into new wholes.

The second type of learning is the acquisition of bodily habits, which frequently goes forward in connection with the progress of perceptual learning just mentioned. Habits may arise directly from instincts, in which case there is little, if any, of the learning processes involved. They may also arise by the method known as that of "trial and success." This method of learning is typical of both man and the lower animals. An unusual situation, or one for which no organized response is already present, calls forth diffuse movements, some of which are accidentally successful and tend, therefore, to be repeated, while the unsuccessful movements are gradually eliminated and an habitual mode of response established. The older education neglected this aspect of the learning process, which is emphasized in the modern subjects of manual training, drawing, etc.

The acquisition of language, written and spoken, is the most important of all human habits, because of its connection with the third type of learning, which belongs essentially to man, namely, the acquisition of power of response through the medium of ideas. Ideas are transmitted by means of language and retained by means of memory; hence, the popular use of the term "learning" as equivalent to memorizing.

In the work of the schoolroom most of these forms of learning are combined. The process of learning to read, for example, involves the perceptual recognition of words and sentences, the motor responses of eye and voice, and, if the reading is not merely mechanical, the acquisition of ideas. E. H. C.

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LEAVES OF ABSENCE. — By this is meant leaves of absence for a term, or year, granted to teachers, for good reasons and frequently on partial pay, their positions being held for them until their return. Such leaves of absence are common in the larger universities, where the sabbatical leave is a well-established institution. In such institutions the teacher is allowed to spend each seventh year in absence on one half, two thirds, three fourths, and sometimes on full pay. In a few of our larger institutions the half-sabbatical is also allowed, a half-year on partial pay being allowed after each three years of service. In the smaller colleges and in the state normal schools such leaves on pay are seldom granted, and, when granted, are more frequently granted for long and meritorious service than as a regular privilege for all. As the salary of the instructors in such institutions is usually so small that they cannot afford to take vacations at their own expense, such leaves of absence for study are seldom taken except by young instructors who are trying to complete their studies for a university degree. The result is that these institutions suffer because their instructors lack contact with men in their own lines in other and in larger institutions. The summer session of the larger universities, however, is doing much to remedy this defect.

In the public schools such leaves of absence for study and travel are confined entirely to a few large cities. Many cities are so far neglectful of their own interests that they refuse to grant leaves of absence to their own teachers, even when they are willing to travel and study at their own expense. In a few cities, such as Boston and Rochester, the plan of granting to teachers a year off from time to time for purposes of travel and study has been adopted; but the number of such cities is as yet very small. Both Boston and Rochester provide for vacations for purposes of travel and study after seven years of service, on half pay, and Boston has provided further for years of rest on full pay for long and meritorious service. A few other cities, as for example Omaha, have adopted the plan of granting leaves of absence for study to those teachers who are willing to take them at their own expense, and, in lieu of any pay while absent, granting salary increases on the basis of such study on the return of the teachers to the school system. Probably few things would be of greater value to teachers in the elementary schools of our cities than an occasional year off on partial pay for purposes of travel or study, and the extension of the plan of sabbatical leaves is one of much importance. Certainly leaves of absence without pay for any worthy educational purpose ought to be granted cheerfully by Boards of Education.

E. P. C.

LEAVING CERTIFICATE. — A form of certificate granted to pupils in elementary or secondary schools, carrying with it certain privileges. In elementary schools such certificates indicate that the pupils have completed certain required work, years, or courses, or have been in regular attendance for a certain time, and are usually used as permits to go out to work. Such a certificate has been in existence in France for thirty years, where it is given, on the basis of a public examination, to those pupils who have completed the primary school course and have reached the minimum age of eleven years. The examination covers only the subjects studied in the elementary schools up to the completion of the *cours moyen*, and the certificates awarded (*certificat d'études élémentaire*) are much esteemed by French children and parents, and are almost a prerequisite for employment of any kind. Another certificate marking the attainment of a somewhat higher stage is the *certificat d'étude primaire supérieure.* (See FRANCE, EDUCATION IN.)

In England local authorities may frame bylaws regulating the total or partial exemption of pupils from school attendance, and in addition may insist that such pupils obtain from an Inspector of the Board of Education a certificate of proficiency to the effect that a candidate has attained the standard of the grade which he should have reached by age. No certificate is granted below the fourth standard or grade. The whole matter is now under consideration of the authorities.

In the United States there is no certificate as such, though the elementary school, or grammar school diploma, granted almost everywhere, is in effect a somewhat similar certificate, but much less highly esteemed by both pupils and employers than is the case in France. Diplomas of graduation are commonly granted to those who complete the eighth grade (in some cases still the ninth) of city schools, and generally the ninth grade (though frequently the eighth, and, in some parts of the South, the sixth) in rural schools. In most cases diplomas signed by the city or county superintendent of schools, or the county board of education, are issued to the graduates, and graduating exercises of a somewhat formal character are very frequently held. To many this marks the completion of their school course, and the diploma thus becomes for them a leaving certificate. The diploma has an academic value almost entirely, and is of use to the pupil only in case he or she desires to enter a high school. In itself it is seldom required or asked for as a prerequisite to employment, and no such importance is as yet placed on its possession as is the case in France.

So far as leaving certificates are granted, they partake of the nature of work certificates, or age and schooling certificates. These are granted in almost all states where a child-labor law is strictly enforced, and they thus become a prerequisite for employment in the case of young persons. A common form is a certificate from the school authorities, stating the pupil's age, and certifying that he is entitled to employment at certain kinds of labor and for certain hours. Pupils from fourteen to sixteen are commonly required to hold such permits, and all illiterate minors, over sixteen, in some states must present evidence of attendance at evening schools to be entitled to employment in the day time. These certificates must be kept on file by the employer, and exhibited, on request, to attendance officers and labor inspectors. Massachusetts presents an excellent example of the employment of this kind of a leaving certificate. Two other forms of such permits, or certificates, are commonly granted. One is a permit to school children, usually between the ages of twelve and fourteen only, granted by the school authorities or the juvenile court judge, on evidence of parental need for the labor of the children, permitting them to engage in certain forms of light labor during certain specified hours. Badges are sometimes used, as in the case of the New York City newsboys. The other form of labor permit or certificate is that permitting children who have been in regular attendance at school during the preceding year to engage in certain forms of labor during the summer or other vacation. Such permits state the age, define the time limits of the vacation, and specify the kind of labor permitted. (See CHILD LABOR; ENGLAND, EDUCATION IN; FRANCE, EDUCATION IN; PART TIME SCHOOL ATTENDANCE.)

Leaving certificates from secondary schools are usually granted to candidates who have reached at least the age of sixteen and have attained a certain standard in secondary school subjects. Most frequently such certificates serve to exempt their holders from other examinations required for entrance into the universities, or certain professions, *e.g.* in England, accounting, medicine, architecture, etc. School leaving certificates may be granted by the State, as in Germany and France, or by universities, as in England and America. In Germany there are two types of leaving certificates, the *Einjährigenschein*, or certificate for admission to one year of military service, granted at the end of a six-year course in a secondary school, and the *Abiturientenprüfung* (*q.v.*), granted at the end of a full nine-year course. In France the leaving certificate is the *Baccalauréat* (*q.v.*). In England there are numerous examining bodies which grant such certificates; the most prominent are the Oxford and Cambridge Joint Board, the Joint Matriculation Board of the Northern Universities, the University of London, and the College of Preceptors. Each university also conducts its own matriculation examinations and system of school inspection, and in many cases the certificates granted are equivalent to leaving certificates. The tendency to establish some system of interrecognition of certificates is at present being considered under the Board of Education, but there is not much likelihood that any general, state-wide certificate, conducted by the central board, will be introduced. (See England, Board of Education, Consultative Committee, *Proposals for a System of School Certificates*, London, 1904 ; and *Report on Examinations in Secondary Schools*, 1911.) In America school leaving certificates are found commonly in the Middle West and the West, along with the general system of accrediting schools.

See ACCREDITED SCHOOLS; ENGLAND, EDUCATION IN; EXAMINATIONS; FRANCE, EDUCATION IN; GERMANY, EDUCATION IN; and other national systems.

LEAVING SCHOOL. — See COMPULSORY ATTENDANCE; RETARDATION AND ELIMINATION OF PUPILS; LEAVING CERTIFICATES.

LEBANON UNIVERSITY, LEBANON, OHIO.— A coeducational institution organized in 1855 as the Southwestern Normal School. The present title was adopted in 1907, and in 1908 by an act of the Ohio legislature the university became a part of the city school system, supported by city tax. Colleges of liberal arts, of business methods, fine arts, a college for teachers, a school for agriculture, summer school, preparatory school, and a university extension department are maintained. More than 4000 students have received a part of their education in this institution.

LEBANON VALLEY COLLEGE, ANNVILLE, PA. — A coeducational institution established in 1866 under the auspices of the United Brethren Church. Academic, college, music, and art departments are maintained. The entrance requirements are fifteen units. Classical, chemical-biological, mathematical-physical, historical-political, and modern language courses are offered, leading to the degree A.B. Of 232 students enrolled in 1910–1911, 119 were in the college department. The faculty numbers twenty-one members.

LECONTE, JOSEPH (1832–1901). — Scientist, university professor, and textbook author; educated at the University of Georgia, the New York Medical College, and the Lawrence Scientific School of Harvard. He was professor in the University of South Carolina (1856–1869) and the University of California (1869–1901). He assisted Professor Louis Agassiz (*q.v.*) on his scientific expedition to the coast of Florida. He was the author of *Elements of Geology* (1878), *Compend of Geology* (1884), *Comparative Physiology* (1900), and of one hundred and fifty scientific and philosophical papers. W. S. M.

LECTURE METHOD. — Any use of extended, formal discourse for the presentation of knowledge to students may be included under the lecture method. It has its largest value and its widest use among mature students and in those subjects where an objective method cannot be readily utilized. Hence its wide use in colleges and universities, where almost all fields, save those of linguistics and the natural and applied sciences, employ it as the dominant method of instruction. The lecture method is only slightly used in the high school, and not at all in the elementary school, save in the highly amended form of short and intermittent talks. Its restricted use in the lower schools is due to the obvious limitations of the method. The instructor has no way of knowing as he proceeds that each point and its relation is mastered, and the student himself is not given the opportunity for interruption in case of failure or doubt in grasping the argument, which would be the case where the method of discussion is utilized. The response of students in the lecture room is receptive rather than active, and the impressions, being given by verbal means with little or no chance for objective or other visual demonstration, are likely to be abstract and verbal, if not actually hazy. H. S.

See INFORMATION TALKS ; also the section on method in the articles on the various academic subjects.

LECTURE SYSTEMS. — The provision of lectures for the public has become widely ramified and has assumed many forms. The system of free public lectures maintained by school authorities, now one of the most widespread, at any rate in the United States, is of recent origin, and was inaugurated in New York in 1889. Free lectures had been provided by the American Museum of Natural History in 1884, but only for teachers. The total number of lectures given in 1909–1910 was 1654 (literature, history, sociology, art, 854; general and applied science, 318; descriptive geography, 391; Italian, Yiddish, and German, 91). These were attended by 959,982 persons, while 134 local superintendents and 56 stereopticon operators were employed. The system was adopted by many large cities, *e.g.* Boston (1896), Philadelphia (1898), Chicago (1897), Newark, Cincinnati, Rochester, and many others. Generally the lectures originated from the activity of clubs or associations, *e.g.* at Boston through the Twentieth Century Club and the Home and School Association, and at Philadelphia through the Home and School League, which worked in connection with school authorities, providing lectures and receiving the use of school buildings. This phase of the subject will be treated under the SCHOOL AS A SOCIAL CENTER. It is also in connection with the school that some city systems and private schools have instituted special lecture courses to which the parents of scholars are invited, and which are afterwards discussed by parents and teachers. (See PARENTS AND SCHOOLS.) Another form of this activity is found in connection with museums in which popular scientific lectures are given in connection with the exhibits. (See BOTANY; LIBRARIES; MUSEUMS.) In addition to these systems of free public lectures, numerous clubs and associations have provided and continue to provide semi-public lectures and courses. Of these the chief may be mentioned, and will be found treated under separate heads: CHAUTAUQUA; CONCORD SCHOOL OF PHILOSOPHY AND LITERATURE; COÖPERATIVE HOLIDAYS ASSOCIATION; LYCEUM; MECHANICS INSTITUTES; Y.M.C.A. Of a more formal character, and differing from public lecture systems in being specialized and technical, and in most cases consisting of courses of lectures, are those conducted for the training of teachers in service (see INSTITUTES; TEACHERS, TRAINING OF); for the improvement of agriculture, conducted by agricultural boards and university departments of agriculture (see AGRICULTURAL EDUCATION); for further education of adults conducted by private organizations, public school authorities, and universities, see ADULT EDUCATION; UNIVERSITY EXTENSION; WORKING MEN'S COLLEGES; WORKERS' EDUCATIONAL ASSOCIATION.

LEE, ROBERT EDWARD. — General Lee's work as an educator only is here considered. Born in Westmoreland County, Virginia, 1807, Lee graduated from the U. S. Military Academy in 1829, with the very unusual honor of a perfect record. Subsequently (1852–1855) he served most ably as superintendent there, gaining an experience useful in his later educational work. At the close of the Civil War, Lee was the idol of the South, and the most respected in the North of all who had been connected with the Confederacy. Bereft of his profession, broken in fortune, he nevertheless declined the offer of an independent estate in England, and refused likewise to lend his name to remunerative financial enterprises. The very esteem in which he was held fixed in him the determination to contribute personally to the rehabilitation of the South. With neither inclination nor aptitude for statesmanship, he selected the field of education as the one in which he could render his best service. Feeling that he belonged to the whole South, he refused the headship of a denominational college. Fearing political entanglements, he declined overtures from the state university of Virginia. Instead he accepted (September, 1865) the presidency of Washington College (now Washington and Lee University, *q.v.*). This institution had been endowed by Washington; but the disasters of the late war had scattered its funds, while a hostile army had destroyed its equipment and all but wrecked its buildings. To the upbuilding of this college as a social agency Lee gave the remainder of his life. His general policy was to make the college course "practical" in order to meet the pressing needs of the devastated section. Departments of engineering and "applied chemistry" were introduced, and a school of commerce planned. To render these newer courses more accessible, the uniform curriculum gave way to the elective system. The success of the new president was in all respects preëminent. In the words of one of his colleagues, "he found the college practically bankrupt, disorganized, deserted; he left it rich, strong, and crowded with students . . . he gave it organization, unity, energy, and practical success." The influence of his personality on the student body was not the least of his successes.

Upon Lee's death (Oct. 12, 1870) the college, feeling itself justly entitled to the honor, had its name changed to Washington and Lee University (*q.v.*) W. H. K.

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LEEDS, UNIVERSITY OF, LEEDS, ENG. — One of the recently founded English universities. The university had its origin in the Yorkshire College, which was formed in 1884 by the amalgamation of the Leeds School of Medicine (1831) and a college of science (1874). From 1887 to 1903 the college was a constituent part of the Victoria University, together with Owens College, Manchester, and University College, Liverpool; and remained such after the last body obtained a university charter. In 1904 Yorkshire College obtained a charter and became by act of Parliament the University of Leeds, with all the usual power appertaining to such a body, "to do all such things as may be requisite, . . . to cultivate and promote arts, science, and learning." The governing body consists of the Court, which is formed by the Chancellor, Pro-Chancellor, Vice-Chancellor, and Pro-Vice-Chancellor, and representatives of the universities and schools, of local councils, of benefactors, of the Crown, and others. The Council is the executive body, and the Senate has the general regulation of academic work. The university is maintained by endowments, donations from different sources, government grants, grants from city and county councils in the Ridings of Yorkshire, and student fees. The Clothworkers' Company of London gives an annual subsidy of £4000, and has provided buildings for instruction in dyeing, textiles, and tinctorial chemistry, while the Skinners' Company supports a department for instruction in subjects appertaining to the leather industries. Work is offered in departments of arts, commerce, law, science and technology, medicine, and dental surgery. With the university are affiliated the Huddersfield Technical College, and the College of the Resurrection, Mirfield. Evening classes and extension courses are given. With the aid of the county council of the North, East, and West Ridings the university conducts agricultural courses and experiments, and sends lecturers and dairying instructors to various local centers. While the general cultural work is strong, the applied sciences receive especial attention. Classes and laboratories are open to men and women on the same terms. The university is not residential, but facilities are afforded for the accommodation of students, who, however, are drawn in the majority from a radius of thirty miles of the city. As in the case of the other universities recently established, considerable progress has been made especially in adaptation to local needs and interests. Professor Michael E. Sadler was appointed Vice-Chancellor of the university in October, 1911. The enrollment in 1911–1912 was 901, with a teaching staff of 152.

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LEFT-HANDEDNESS. — See AMBIDEXTERITY.

LEGAL EDUCATION. — See LAW, EDUCATION FOR THE.

LEGAL RIGHTS OF CHILDREN. — See CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF.

LEGISLATION, EDUCATIONAL. — See COMMISSIONS, EDUCATIONAL, RECENT AMERICAN; SCHOOL LAWS AND DECISIONS.

LEHIGH UNIVERSITY, SOUTH BETHLEHEM, PA. — Founded in 1865 as a result of the gifts and bequest of Judge Packer, amounting to $2,000,000. The aim of the university is to provide technical, literary, and scientific preparation for the type of work demanded by the resources of the region. The institution is well equipped with large laboratories to give instruction in civil, mechanical, metallurgical, mining, electrical, and chemical engineering, and in electro-metallurgy, chemistry, and collateral studies. The entrance requirements are fourteen units. The university confers the degrees of A.B. and B.S. and the various degrees in engineering. A special course is also provided for teachers, a psychological laboratory and a practice school being maintained. In 1910–1911 the number of students enrolled was 655. The faculty consists of seventy-three members.

LEHR- UND LERNFREIHEIT. — See FREEDOM, ACADEMIC.

LEIBNITZ, GOTTFRIED WILHELM, FREIHERR VON (1646–1716). — One of the two or three most universal minds in modern history; contributed new ideas and projects of fundamental reform to nearly all the larger provinces of inquiry and practice, education among them. His place in educational history is scarcely comparable to that which he holds in mathematics (as the inventor, simultaneously with Newton, of the calculus), in logic, in metaphysics (theory of monads), and in rational theology (as the chief representative of the eighteenth-century type of optimism). His father, professor of ethics and law at Leipzig, dying early, the boy was largely self-taught; by omnivorous reading in his father's library, he declares that he learned far more than at school. His studies met the opposition of his schoolmaster, who, finding him reading Livy in Latin for pleasure, endeavored to arrest this "premature" erudition, and to restrict his pupil to the catechism and the *Vestibulum* of Comenius. This experience left its impress upon Leibnitz's educational theory; he was always strongly convinced of the folly of treating all children by the same rules and of the danger of quenching the child's natural intellectual curiosity by taskwork. Leibnitz received his baccalaureate at the University of Leipzig at seventeen; next studied mathematics at Jena; and took his doctorate in law at Altdorf in 1666. A decisive epoch in his intellectual development was a residence in Paris, 1672–1676, interrupted by travel in England; at this time he came into contact with the full stream of new ideas in philosophy, mathematics, and the natural sciences. During part of the same period, he had his one experience in practical pedagogy, acting as tutor to the sixteen-year-old son of his former patron, the Baron von Boyneburg; the subsequent career of the pupil was not discreditable to the teacher. In 1676 Leibnitz took the post of councillor and librarian to the Duke of Hannover (Brunswick-Lüneburg); in this service, save for several extensive journies, he continued till his death, forty years later. His manifold scientific interests and his endless ingenious plans for the advancement of civilization — which ranged from a scheme of compromise by which he hoped to reunite Protestants and Catholics, to the invention of a calculating machine — involved him in a voluminous correspondence with over a thousand persons, including most of the important scholars, philosophers, statesmen, and sovereigns of Europe. This prodigious epistolary activity prevented him from giving any adequate connected presentation of his philosophy. Convinced of the dependence of public welfare upon the progress of science, and of the dependence of the progress of science upon coöperation and organization, he brought about under royal patronage the creation of the Society (afterwards Academy) of Sciences of Berlin, and sought to persuade Peter the Great and other monarchs to establish comprehensive institutions for research and the diffusion of knowledge.

The general philosophy of Leibnitz, one of the most involved, technical and, at first acquaintance, paradoxical in modern thought, cannot otherwise than misleadingly be set forth in brief space. The part of it most nearly pertinent to educational theory is the epistemological doctrine of the posthumous *New Essays concerning Human Understanding*, 1765 (English tr., Langley, 1896), a polemic against Locke's sensationalistic account of the origin of ideas. Other of the important philosophical writings of Leibnitz may be had in English translations by Duncan, 1890, Latta, 1898, and Montgomery, 1902.

The direct contribution of Leibnitz to educational theory is to be found chiefly in a brief work written in his twenty-first year: *Methodus nova discendæ docendæque jurisprudentiæ* (pub. 1667). The book is chiefly a treatise on the study of jurisprudence, but the first part of it deals with intellectual education in general. It is characteristic of Leibnitz that he defines both the process and the end of education in terms of activity; its aim is " the acquisition of a permanent readiness for action " of any desired sort (*agendi promptitudinem acquisitam permanentem*). Such acquired power of action, or *habitus*, may characterize anything capable of action, even inanimate things. The process by which it is acquired is "habituation" (*assuefactio*), or a " making accustomed " to the desired activity itself. Education is thus for Leibnitz merely the highest form of a process which is exemplified even in the inorganic, — as when by bending metal rods we accustom them to recoil in a certain way. With animal training, in particular, the training of children is closely related. " Since infants in their early years do not greatly differ from the brutes, their instructors might not unprofitably borrow something from the methods of the teachers of animals." The term *doctrina* covers the process of "habituation" in all sentient beings, animal or human; *institutio* is the special form of it adapted to the training of the rational animal. At all its levels " habituation " depends chiefly upon two factors: the frequency (*multitudo*) of the impressions made by the practice acts, and their intensity (*magnitudo*). In teaching, the former requires very frequent reviews — not merely " annual reviews, as in the ordinary schools, but daily, weekly and monthly " as well. The latter demands that each repetition have *quamdam vim imprimendi*, *i.e.* a power of actually making an impression on the child. This may be gained partly by associating the matter taught with vivid sense impressions, preferably of more than one sense. Both can best be realized by a carefully graduated increase in the attainments demanded. Throughout, it is important that the acquisition of the *habitus* be made agreeable (*jucundum*), either by showing its connection with attractive ends, or " by the use of means that are themselves agreeable." That children ought so far as possible *discere ludendo*, " to learn by playing," is one of Leibnitz's most constant and characteristic contentions. Teachers must so act that the pupils " may of their own accord (*sponte*) make themselves more capable of learning." Leibnitz, therefore, recommends the use of alphabetical blocks, pictures, instructive games, and of the *Orbis pictus* of Comenius (*q.v.*), which pupils should be set to paint in appropriate colors. In order that the maximum instruction may be accomplished with the least possible fatigue of the pupils, only part of the day's lesson should be studied by any one child; then, " while he recites the others will, by listening, learn his portion as if at play."

The course of instruction should be divided into four periods. During the first, that of infancy, the child should learn at home the vernacular, Latin, and some history. If he talk Latin in the morning with his master and fellow pupils, " and the vernacular the rest of the day with the women and servants," it is quite possible for a knowledge of two languages to be acquired simultaneously at an early age. From his sixth to twelfth year the child should attend the public school; " let him not live too much at home, in order that he may learn to care for himself." The studies of this period include a "more special knowledge of history," mathematics, *elegantiæ verborum*, and several natural sciences, together with music and various physical exercises. From twelve to eighteen the youth should have more freedom, studying, " not under preceptors, but friends," in the university. Besides learning a number of sciences, French and Italian, and enough Greek and Hebrew to enable him to read the Bible in the original, he should " declaim publicly and act in stage-plays." The fourth period, beginning at eighteen (or twenty, in the case of those who mature slowly), should be devoted to travel and the study of the life, laws, and institutions, and the industrial, commercial, and agricultural methods of foreign countries. To such studious *peregrinatio* Leibnitz at this time attached great importance, not only for its benefits to the individual, but also as a means of promoting international good will, and of making the special attainments of each people eventually the possession of all. Later (1696), in his *Projet de l'éducation d'un prince*, he discountenances early foreign travel for curiously chauvinistic reasons. But the principle *discere ludendo* is still reiterated.

The educational doctrine of the *Methodus Nova* is an extraordinary production for the seventeenth century. It is remarkable not only for what it contains, but also for what it is free from. There is in it none of that use of vague analogies from the " method of Nature " characteristic of Ratke and Comenius (*qq.v.*). So far as it goes, the method of Leibnitz is purely psychological.

In 1711 Leibnitz wrote to a friend that he had often contemplated a new edition of the *Methodus Nova* and an amplification of the part dealing with education in general. " There are, decidedly, some thoughts in this little book which even now I do not think ill of." This project of revision was never executed. But the book was reprinted in 1748, with a preface by Chr. Wolff.

A. O. L.

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See also BALDWIN, J. M. *Dictionary of Philosophy and Psychology*, Vol. III, pt. 1, pp. 330–338.

LEIGH, EDWARD (1642–1671). — Writer on the history of religion and learning; born at Shawell in Leicestershire. He graduated B.A. from Magdalen College, Oxford, in 1620, and M.A. in 1623. He entered the Middle Temple, and in 1625 spent six months in France. In 1640 he was elected M.P. for Stafford. He was a member of the Assembly of Divines, and colonel in the Parliamentary army. In 1656 he published a *Treatise of Religion and Learning and of Religious and Learned Men*, in which he advocates the "Syncretism of Religion or of a friendly reconciliation of the different parties amongst themselves." Of learning he distinguishes three types: (1) that which draws us to itself by its own force, *e.g.* virtue, knowledge, and truth; (2) that which is desired for fruit and profit, as money; (3) that which draws us both by its force and dignity and by profit. He then proceeds to show how learning has always been appreciated, and points out the value of learning in different professions, especially the clerical. But human knowledge is valuable for practice, not for ornament or pride. In the Scriptures are " all the treasures of natural and moral philosophy, of politics, of poetry, of history, of mathematics, of metaphysics." Leigh still favors the seven liberal arts, and also recommends the study of mathematics, the civil and canon law, and oriental languages. He gives an account of universities at home and abroad, and in the latter part of the work adds a Biographical Dictionary of famous men in religion and learning. Another work by Leigh is *Three Diatribes or Discourses, First of Travel or a Guide for Travellers into Foreign Parts. Secondly of Money and Coyns. Thirdly of Measuring the Distance betwixt Place and Place.* (1671.) He points out the usefulness to society at large from the journeys of travelers, and gives examples of travel for study, and its value for the advance of the knowledge of foreign languages, although he regards the " Latin tongue " as still necessary for the traveler. For Leigh's references to books on travel, see TRAVEL, EDUCATIONAL VALUE OF.

Leigh was also well known for his *System or Body of Divinity . . . wherein the fundamentals of Religion are opened, the contrary errours refuted*, 1654. In connection with scholarship, his most important production was *Critica Sacra or Philologicall and Theologicall Observations on all the Radices or Primitive Hebrew Words of the Old Testament in Order Alphabeticall* (final form published 1662). This was " the best Hebrew-English lexicon of the age " (D. M. Welton, *John Lightfoot, the English Hebraist*, Leipzig, 1878). F. W.

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LEIGH, EDWARD (1816–1889). — Educational writer and textbook author; graduated from Brown University in 1835, and three years later from the Andover Theological Seminary. For many years he was engaged in educational work in St. Louis. Author of *Illiteracy in the United States*, and readers, spellers, and other school books. W. S. M

LEIPZIG. — See GERMANY, EDUCATION IN.

LEIPZIG, THE ROYAL SAXON UNIVERSITY OF. — The second oldest university in the present territory of the German Empire, having been established in 1409 by Papal Bull of Alexander V under Frederick the Quarrelsome, Landgrave of Thuringia and Margrave of Meissen, and his brother William, who welcomed the German students on their leaving the University of Prague under their professors Otto von Münsterberg and Johann Hoffmann as a result of university legislation in favor of the Bohemians. The University of Prague served in most particulars as a model. The first year

369 students were enrolled. The details of the early history of the institution are somewhat veiled in mystery; no definite information is available, for example, as to whether the university was composed from the very beginning of the four traditional faculties. Originally there were two "colleges," which served as homes of students and professors, but the student body rapidly outgrew these accommodations. By the close of the fifteenth century, Leipzig could boast of a larger attendance than any other North German university, and soon became for a time the most renowned institution of higher learning in Germany, as it is unquestionably one of the foremost universities of the world to-day. The establishment of a university in the neighboring town of Wittenberg in 1502 made serious inroads on the attendance at Leipzig, but from the close of the sixteenth century on, through the seventeenth century, the institution had a larger enrollment than any other German university. By the beginning of the sixteenth century Leipzig had become thoroughly saturated with the humanistic spirit. It was not until 1539, under the influence of Melanchthon, that the principles of the Reformation carried the day, a complete reorganization being completed in the year 1559. At this time Leipzig was the wealthiest university in the land, but shortly afterwards a period of deterioration set in, which lasted for over a century, the institution being characterized by an ultraconservative spirit that looked askance at improvements and innovations. It was as a result of this spirit that Thomasius (*q.v.*) after his dismissal turned to Halle, and began his lectures in that city in 1690. (See HALLE, UNIVERSITY OF.)

It was not until after the Napoleonic disturbances were over that significant internal reforms began to be instituted; in 1830 a complete reorganization was effected, and in the following year the erection of a new university hall furnished an important addition to the material equipment of the institution. Thirteen years later a dormitory and a lecture building were added, and soon after a period of building activity was begun which resulted in the erection of a whole series of institutes and clinics of one kind or another (for illustrated description see the *Festschrift* cited under References), of a splendid library, and of a new main building (completed in 1897), Leipzig in this respect being better equipped than most other German universities. The new *Aula* contains a colossal painting by Max Klinger, representing the development of Greek culture. For several decades large contributions have been made by the state, about three million dollars having been supplied for building purposes between 1878 and 1902. Inasmuch as the kingdom of Saxony has only one university to support, as against ten in Prussia, usually large funds are available for maintenance, the annual budget amounting to nearly one million dollars, a sum exceeded in Germany only by the appropriations made for the University of Berlin. The library was founded in 1544 by Kaspar Borner, during whose administration as rector of the university (1539–1543) marked advances were made. The new building, which was completed at a cost of over one million dollars in 1891, contains 550,000 volumes and about 6000 Mss. The University of Leipzig is especially well supplied with institutes and departmental libraries, among which may be mentioned the Germanistic institute (11,000 volumes, Sievers), the institute for experimental psychology (Wundt), the pedagogical seminar, the physical-chemistry laboratory, and the *Institut für Kultur- und Universalgeschichte* (22,000 volumes, Lamprecht), of which the last, located in the *Haus zum goldenen Bären* (erected in 1736, and occupied by Gottsched up to the time of his death in 1767), deserves particular mention. The faculty of philosophy includes a department of agriculture with an agricultural institute, and a department of veterinary medicine with a veterinary clinic and a polyclinic.

Among prominent teachers associated with this institution mention may be made of Johann Christoph Gottsched and Christian Fürchtegott Gellert in literature, Stobbe and Windscheid in jurisprudence, Cohnheim in pathology, Thiersch in surgery, Weber in anatomy, Curtius in classical, Wülker in English, and Hildebrand, Haupt, and Zarncke in Germanic philology, Wachsmuth in history, Roscher in economics, Overbeck in archæology, Christian Hermann Weisse and Fechner in philosophy; Johannes Olearius and Julius Franz Delitzsch in theology; Möbus in astronomy; Leuckart in zoology; and Wislicenus in chemistry. Goethe was a student at Leipzig from 1765 to 1768.

In the winter semester of 1911–12 there were 4900 matriculated students in attendance, Leipzig being the third largest university in Germany, and exceeded only by Berlin and Munich. Of these students 391 were enrolled in the faculty of theology (Protestant), 872 in law, 841 in medicine, 108 in dentistry, and 2816 in philosophy; in addition there were 925 auditors. The teaching staff consisted of 242 instructors, of whom 76 were docents. The King of Saxony is rector magnificentissimus, a rector magnificus being elected annually by the faculty.

The city of Leipzig also contains a commercial college founded in 1898 (about 500 students), a Royal Conservatory of Music, an institute for experimental pedagogy and psychology, established by the Teachers' Association of Leipzig in 1906, the library of the imperial court (159,000 volumes), a city library founded in 1677 (126,000 volumes), and a pedagogical central library founded in 1872 (over 150,000 volumes). R. T., Jr.

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LEISURE. — See Play.

LELAND, CHARLES GODFREY (1824–1903). — The American poet and author; exercised a profound influence in the movement for the introduction of the industrial arts in schools. In 1881 there was established under his direction the Public Industrial Art School of the city of Philadelphia, maintained from funds appropriated by the school board. Leland himself had charge of design, while all the other arts, modeling, painting, mosaic, pottery, carpentry, woodcarving, cabinet-making, metal work, embroidery, etc., were under the charge of, though not taught by, J. Liberty Tadd. The principle on which Leland based his experiment was that the race has developed the ornamental before the useful. Such work results in mental and moral improvement, forms the foundation for trade preparation, and, if generally introduced in all schools, public and private, would break down false notions about labor. Leland's work attracted considerable attention in America and Europe. The British Home Arts and Industries Association, of which Walter Besant (*q.v.*) was treasurer, was inspired by Leland's work (*Minor Arts*) and his school. Leland wrote many practical guides and manuals in various fields of industrial arts; his chief work on the general subject is his pamphlet on *Industrial Art in Schools,* contained in the *Circulars of Information* issued by the United States Bureau of Education (No. 4, 1882).

LELAND STANFORD JUNIOR UNIVERSITY, STANFORD UNIVERSITY, CAL. — A coeducational institution founded in 1885 through the gift of Mr. and Mrs. Leland Stanford in memory of their son. "Its object is to qualify students for personal success and direct usefulness in life." The university is located on the Palo Alto Farm in the Santa Clara Valley, thirty miles southeast of San Francisco. The grounds consist of over nine thousand acres, partly level and partly rising into the foothills of the Santa Cruz Range and overlooking the Bay of San Francisco. The central group of buildings is ranged round two quadrangles, the one consisting of twelve, the other of fourteen buildings. The buildings of the medical department, which was established in 1908, are located in San Francisco, and are four in number, including the Lane Hospital. Fifteen units are required for entrance. A four-year course leading to the degree of Bachelor of Arts is offered. Tuition is free except in the professional courses of law and medicine. With the exception that English composition is a prescribed study in the first year for those who do not satisfy the matriculation test, the undergraduate work in all departments is elective. Students must select as their major subjects the work of some one department, and as minors some collateral work. Advanced courses are offered leading to the degree of Master of Arts, the professional degree of Engineer, Juris Doctor, Doctor of Medicine, and Doctor of Philosophy. The high school teachers' certificate is granted by state, city, and county boards of education, on the recommendation by the university, to candidates who have fulfilled the requirements of the State Board of Education. The grammar school teachers' certificate is also granted to graduates of the University on fulfilling the requirements. The University library contains 197,000 volumes, including the Hopkins Railway Library, the Thomas Welton Stanford Australasian Library, the Hildebrand Library, mainly of works as Germanic philology and literature, and the Jordan Library of Zoölogy, consisting of several thousand volumes and pamphlets on fishes. The Leland Stanford Junior Museum contains valuable collections of pictures, antiquities, pottery, laces, and curios. An active fraternity life has been developed among the students, many of whom live in the fraternity houses. The students enrolled in 1911–1912 numbered 1762, distributed as follows: graduates, 208; undergraduates, 1450; specials, 104; summer session, 59. Leland Stanford Junior University is one of the institutions on the accepted list of the Carnegie Foundation for the Advancement of Teaching. It has a productive fund amounting to $21,000,000, and the income for 1910–1911 was $886,550. The faculty consists of sixty-one professors, twenty-eight associate professors, thirty-seven assistant professors, and forty-six instructors, and one hundred and forty-seven lecturers and assistants. David Starr Jordan, Ph.D., L.L.D., is the president.

LELAND UNIVERSITY, NEW ORLEANS, LA. — A coeducational institution for colored students, incorporated in 1870, and owing its existence to the gifts of Mr. Holbrook Chamberlain of Brooklyn. College and normal departments, each with preparatory departments, music, manual training, and theological departments are maintained. A number of auxiliary schools are under the charge of the university. The entrance requirements are equivalent to a four-year high school course. The college course leads to the degree of A.B. The faculty consists of sixty-eight members. The enrollment in 1911–1912 in all departments was 1715.

LEMBERG, THE IMPERIAL ROYAL FRANCIS UNIVERSITY OF. — This university is situated in the city of that name, the capital of the province of Galicia, Austria, and is the younger of the two Galician universities, the older being Krakow. It had its origin in a Jesuit institution, established in the second half of the seventeenth century, the original charter dating from the year 1661. It was not until almost a century later, however, that this charter received the Papal sanction, the confirmation of King August III in 1758 being followed a year later by a bull of Pope Clement XIII. In 1784 the Jesuit college was transformed into a state institution by Emperor Joseph II, the language of instruction from this time on until 1824 being Latin. In 1805 the institution was again reorganized and given the rank of a lyceum, and eleven years later it was raised by Francis I to the dignity of a university of three faculties, theology (Catholic), philosophy, and law and political science, the medical faculty not having been added until 1891. The faculty of philosophy includes a department of pharmacy. From 1824 until 1871 German was employed as the language of instruction in the faculty of philosophy and in the majority of courses given under the faculty of law. Since that time, however, a number of changes have been instituted, and at the present day Polish holds complete sway. The library of the university contains about 220,000 volumes, over 900 manuscripts, and almost 12,000 coins and medals. The annual budget amounts to approximately $275,000. In the winter semester of 1910–1911 there were 4704 students in attendance, of whom the majority were registered in the faculty of law.

Lemberg also contains a technical school, founded in 1884, in which the language of instruction is Polish and which was attended by 1745 students in 1910–1911, a college of veterinary medicine, founded in 1881, which grants the degree of Doctor of Veterinary Medicine, and the Ossolínski National Institute, which contains a library of 130,000 volumes, especially valuable for Polish history and literature, and almost 5000 manuscripts, over 2000 maps, 22,000 coins and medals, autographs, engravings, paintings, etc. R. T., Jr.

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LENOX COLLEGE, HOPKINTON, IA. — A coeducational institution opened in 1859; it is under the care of the Presbyterian Synod of Iowa. There are maintained an academy, college of liberal arts, a school for teachers, and schools of commerce, agriculture, music, expression, and art. Two courses are offered, leading respectively to the degrees of A.B. and B.S. The enrollment in 1910–1911 was 138 students. The faculty numbers fifteen members.

LEONARD AND GERTRUDE. — The title of Pestalozzi's epoch-making educational romance. See Pestalozzi.

LEONARDO FIBONACCI. — See Fibonacci.

LEONARDO OF PISA. — See Fibonacci.

LESSING, GOTTHOLD EPHRAIM (1729–1781). — This German critic, dramatist, and philosopher is one of the very few men who, without becoming a teacher or a writer of educational books, have won permanent places for themselves in education. He was born at Kamentz, Saxony, and died at Wolfenbüttel, Brunswick. He was the son of a Protestant minister, and was destined for the Church. He early showed ability as a student, but the attempts to give him university training, first at Leipzig and then for medicine at Wittenberg, resulted in failures, because of his growing fondness for the drama. He then decided to make literature his profession. In spite of financial limitations, many disappointments, and frequent change of residence, he became the best expression of the German *Aufklärung*, and gave the Leibnitz-Wolffian philosophy a new impulse by adding a poetical element and by turning it into effective channels of individual culture. He may be credited with having created the art of modern literary criticism, and awakened the national, literary spirit of modern Germany. His greatest work is *Laokoön, or the Limits of the Plastic Arts and Poetry* (1766). His best dramatic writing is *Minna von Barnhelm* (1767), which led the way for a distinctive German literary expression, and in more recent years has been serviceable in American schools as a reading text for students of German. While director of the national theater in Hamburg, he so presented the traits of dramatic art and so struggled for freedom from French standards in the Hamburg dramatics (1767–1769) as to arouse critical opposition to his æsthetic ideals. After being compelled to cease the religious controversy in his later years occasioned by his anonymous publication of Reimarus's *Wolfenbüttel Fragments*, he employed the drama as a means of expressing his passion for freedom of thought, writing *Nathan the Wise* (1778–1779).

Lessing's influence on education was in large part directly due to his manner of conceiving and interpreting the problem of the spiritual nature of man from the pedagogical point of view. The philosophical and religious issues of his age received profound modification because of the singular aid he brought to them from his large and bold conception of education. Education puts nothing foreign into a person, but only anticipates what each one could secure for himself. Its results cannot be attained at once, but depend upon irregular stages of development. It assumes the possibility of the moral perfection of man, which includes the ideals of rationality and freedom. These cannot be obtained by a single individual nor by a single age. Education uses for purposes of discipline and instruction the material that can be gathered only in experience. The most important problem in education is, not an arousing of emotion, but a formation of the will through a construction of a rational field of thought. As each individual appears at a certain level in the total development of humanity, he must be trained to look to the past, and not forget the task of advancing the future. Education is the orderly arrangement of the development of working ability in the pupil in conjunction with the adapted order of the topics of instruction.

God leads the human race in a way, not analogous to, but identical with, the process of the education of the individual. Tracing this educational parallelism between the race and the individual is the task of Lessing's briefest, and one of his most important books, the *Education of the Human Race* (1780). Religious dogmas he revised in the light of universal development. Religion and revelation go together, for the history of positive religion is merely the divine education of humanity. Man's actions are guided at first by instinct; reason slowly acquires direction of the will, until finally freedom appears. Education is the natural and normal process whose methods and ideals are applicable equally to the individual and to the race. The recapitulation theories which play an important rôle in the educational thinking of the nineteenth century had their sane and vigorous start in Lessing's keen analysis of the educational process and the application thereof to the phenomena of reason, religion, history, and society. E. F. B.

See Æsthetics; Humanism; Neo-Humanism.

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LESSON PERIOD. — See School Management.

LESSON PLANS. — It is the practice of supervisors in training or practice schools to demand plans of the lessons to be taught by student-teachers or apprentices. These are written and submitted to the supervisor in advance for criticism. They vary somewhat in form, but in general they agree in calling for a statement of the special aims of the lesson, the subject matter selected for the purpose, and the pedagogical methods employed at each step of the procedure. The subject matter and the teaching procedure are frequently stated in parallel columns so as to indicate their relation in time sequence. At first only a single lesson is included within the plan; later several lessons may be included within the unit of a larger topic; thus weekly, monthly, and term plans of teaching procedure may come within a single plan. In certain schools where close supervision of teaching is provided, lesson plans extending over the wider units of time may be required of teachers in regular service.

The lesson plan is useful in assisting the young teacher to organize his work, in giving the supervisor some means of preventing avoidable mistakes and crudities, and in saving the teacher in the classroom from that diffuseness which is likely to arise in adjusting the process of instruction to the children's interests, errors, questions, and doubts. In so far as the lesson plan fixes a general procedure in the mind of the teacher and leaves the specific adaptations to be made in the classroom, it is a useful device. Overinsistence upon the writing and following of lesson plans may make the instruction formal and rigid, depriving it of that flexibility and spontaneity which are requisite in using the full resources of teacher and pupils. The application of the lesson plan in any very detailed way to the supervision of teachers in service is a doubtful procedure. A trained and experienced teacher charged with the full responsibility of class control and instruction has neither the need nor the energy for the preparation of detailed written plans. The teaching art is so much a matter of opportune presentation and interpretation of experience that a clear knowledge of the purposes of the school, a scholarly command of subject matter, and a command over the fundamental principles of teaching once acquired are about all that the professionally trained and experienced teacher requires by way of preparation. The rest is a matter of insight and inventiveness in the face of classroom situations. Frequent self-criticism and supervisory aid provide for the proper growth required from year to year. H. S.

See Teachers, Training of; Supervision of Teaching.

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LESSON, TYPES OF. — The term "lesson" is applied to the unit of teaching activity which occurs within the time assigned to a class period in the school schedule. For the purposes of administration these lessons are designated in terms of the subject matter treated, *e.g.* geography, reading, civics, or geometry lessons. For the pedagogical purposes of teaching and supervision, they are named after the dominant type of teaching method employed in the lesson, *e.g.* drill, review, examination, recitation, developmental lessons. H. S.

See TEACHING, TYPES OF.

LETTER METHOD. — In the teaching of reading or spelling, any method which utilizes the letter as a unit of analysis or synthesis in the treatment of the structure or sound of words is a "letter" method of teaching. Thus (1) teaching spelling or reading by spelling the letters, the alphabetic method; (2) by sounding the letters, the phonetic-alphabetic method; and (3) by marking the letters and then sounding them, the diacritical method, are all species of the "letter" method. H. S.

See ALPHABETIC METHOD; PHONETIC METHOD; DIACRITICAL METHOD; READING, TEACHING OF; SPELLING, TEACHING OF.

LETTER-WRITING. — See EPISTOLÆ.

LETTERS AND ARMS. — The famous controversy as to the precedence of physical prowess in war, or the mental triumphs of learning and knowledge was part of the larger dispute between noble birth and personal merit. The humanists appealed to Cicero's dictum, *cedant arma togæ.* The Ingenious Gentleman, Don Quixote (pt. 1, ch. xxxviii. Ormsby's translation, pp. 212 *et seqq.*), compares the student and the soldier, a favorite comparison, when the days of chivalry ripened into the Renaissance. Letters say that arms cannot be maintained without the laws laid down in military writers. Arms can equally reply that without them laws laid down in letters cannot be maintained, for states are dependent for their very existence upon their armies.

Judged by difficulties of attainment, eminence in letters may require "time, watching, hunger, nakedness, headaches, indigestions, etc." But to become a good soldier "costs a man all the student suffers, and in an incomparably higher degree, for at every step he runs the risk of losing his life." Don Quixote makes an attack on "engines of artillery" and assigns their invention to hell, for making it easy "for a base and cowardly arm to take the life of a gallant gentleman." It is clear that Don Quixote awards the palm to the soldier over the student. Mr. H. E. Watts (*Don Quixote,* Vol. II. p. 211 n.) quotes from Bowles the name of a work entitled *Discorso supra la Lite delle Armi et delle Lettere* (Firenze, 1580) by Francesco Bocchi, who, like Don Quixote, decides in favor of arms. He also names a treatise entitled *Pro Equite contra Literas Declamatio* by a Spaniard, Juan Angel González, published at Valencia in 1549. In 1576 Louis Leroy wrote a book contrasting modern and ancient knowledge, and entitles it the *Interchangeable Course or Variety of Things in the whole World; and the Concurrence of Arms and Learning, through the first and famousest Nations* (translated into English by Robert Ashley in 1599). Leroy has no hesitation in awarding the palm to learning; and this was the position taken up in most of the books as the Renaissance spirit gained sway. The discussion naturally plays an important part in the books on the education of gentlemen and nobles (*q.v.*). Thus, Ascham (*q.v.*) in his *Schoolmaster* (1570) describes the whole tendency of Castiglione's *Cortegiano* (*q.v.*), "To join learning with comely exercises Conte Baldesar Castiglione doth trimly teach."

In 1595 William Jones translated the *Nennio or Treatise of Nobility* written by John Baptista Nenna of Bari, who was both a doctor and a knight. The author hesitates to say which is more excellent and noble, "that which doctors purchase by their learning or knights by arms." In 1598 J. Keper translated the *Courtiers Academie* of Count Hannibal Romei (first published in Italian at Ferrara in 1588). In this book Romei devotes a chapter to the subject of the "Precedence of Letters and Arms, two most principall Faculties" — and decides in favour of military art, which according to the author has all the characteristics of the liberal arts, *viz.* "material subject, end, and the instrument which to the end conduceth." F. W.

See CHIVALRIC EDUCATION; GENTRY AND NOBLES, EDUCATION OF.

LEVELS OF DEVELOPMENT. — See GROWTH; CHILD PSYCHOLOGY; ADOLESCENCE AND YOUTH; also PLATEAU.

LEVERETT, JOHN (1662-1724). — Seventh president of Harvard College; educated at the Boston Latin School and Harvard College, graduating in 1680. He engaged first in the ministry and later in political life. He was speaker of the House in the Massachusetts Legislature and judge of the superior court of that commonwealth. He was president of Harvard College from 1708 to 1724. W. S. M.

LEWIS, DIO (1823-1886). — Author of a system of gymnastics; graduated from the Harvard Medical College (1845). He was teacher in the public schools and lecturer on physiology and physical training from 1837 to

1861, when he founded in Boston a normal school for the training of teachers of gymnastics. Author of *New Gymnastic System* (1862), and many essays on physical training.

W. S. M.

LEWIS, SAMUEL (1799 - 1854). — First state superintendent of schools of Ohio. He attended the public schools and engaged in teaching. He did pioneer work in Ohio, and, as state superintendent (1837–1843), he investigated the educational conditions of the state on horseback, visiting over three hundred schools during his first year in office. He secured the enactment of a state school fund, the privilege of loans to poor districts for the erection of schoolhouses, and the publication of a state educational journal, *Ohio School Director*, of which he was the first editor. He was one of the organizers of the Western Literary Institute (*q.v.*), and continued a member of the Ohio State Board of Education from the expiration of his term of office to the time of his death. W. S. M.

Reference: —

Barnard, H. *American Journal of Education*, 1858, Vol. V, pp. 729–740.

LEXICONS. — See Latin Language and Literature in Education; Dictionaries.

LEYDEN, UNIVERSITY OF, HOLLAND. — One of the four royal universities of Holland, founded in 1575 to commemorate the successful end of the siege of the town by the Spaniards. Given the choice by William I of immunity from taxation or the permission to found the university, the citizens preferred to establish a " free public school and university." The institution was housed at first in the Convent of the White Nuns, part of which was rebuilt by the municipality in 1618 and is still used. The university at once became the center and rallying point of Protestant students, Huguenots from France and Puritans from England, and attained a great reputation in Europe through the eminence of its scholars and teachers, among whom was Joseph Scaliger, Lipsius, Vossius, Heinsius, Grotius, Salmasius, Boerhave, Arminius, etc. In 1807 the Leyden became a royal university of Holland, but in the Napoleonic reconstruction of 1811 it was turned into an academy of the University of France, only to be restored to its earlier position in 1815. Its present organization goes back to the Law for Higher Instruction of 1876. There are now five faculties: law; medicine; science; letters; and theology. A remarkable feature of this university, as of other Dutch universities, is the extent of academic freedom enjoyed by teachers and students. The enrollment in 1910–1911 was 1195.

See Netherlands, Education in.

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Sandys, J. E. *History of Classical Scholarship*, Vol. II. (Cambridge, 1908.)
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LEYS SCHOOL, CAMBRIDGE, ENGLAND. — See Grammar Schools, English; College; Colleges, English; Public Schools.

LIBANIUS. — A distinguished Greek sophist (*i. e.* teacher of rhetoric and oratory) of Antioch in the fourth century A.D. He was born in 314, of one of the respected families of Antioch. His father dying when he was eleven years old, he was left to the care of his mother and her two brothers, who undertook personally to direct his education. Until he was fifteen he displayed little liking for books, but he was then seized with a passionate desire for learning, which led him in the end to seek the sophist's life. At the age of twenty-two he went to Athens, and spent four years at the university there. He opened his first school at Constantinople, where he taught with great success, but, being compelled by the intrigues of rival sophists to leave the city, he retired, first to Nicæa, then to Nicomedia. At Nicomedia he taught five years, at the end of which time he was recalled to Constantinople. In 354 he removed to Antioch. There he at first set up a private school, but soon received an official appointment, with a salary from the state. He taught at Antioch until about 394, which was probably the year of his death.

Libanius's position as "sophist of Antioch" (the title given him by John Chrysostom) was one of great importance in the city, and carried with it much personal influence. The school of which he was head consisted of himself, at least four "rhetors" (probably teachers of the more elementary or technical, or of the more practical, as distinguished from the more literary, part of oratory), one or more "grammarians," or teachers of literature, and, at one time, a teacher of Latin, and possibly a teacher of law. Either by appointment or through his personal influence, he acted as Director of the whole school and university system of Antioch, subject, of course, to the direction of the municipal council and the emperor. He was the mouthpiece of council and teachers in their dealings with each other, and at times made the selection of new teachers, and determined, in some degree, the amounts of their salaries. Libanius's pupils came from all parts of Asia, as well as from other parts of the Greek world. They went forth from his school into nearly every walk of life. Though firm in his adherence to the old faith, he numbered among his friends pagans and Christians alike. He had great influence with all ranks of officials, and was ever ready to advance the interests of his fellow citizens and of his city. He was admitted to the intimacy of the Emperor Julian, by whom he was greatly admired, and whose untimely death he bitterly lamented.

Libanius has left us a considerable body of writings. They are: sixty-four speeches, including an autobiography, about fifty declamations, a large mass of rhetorical and school exercises, such as descriptions, character sketches, narratives, together with arguments to the speeches of Demosthenes, and over fifteen hundred letters, addressed to all classes and kinds of men. The speeches are on topics and events of the day, and they abound in autobiographical notices and in references to the life of the times. A like interest attaches to the letters, which are invaluable for a depiction of Libanius's character and for information about the men and the manners of the day.

The best edition of Libanius is that of Richard Förster, which is still in course of publication and of which six volumes have been published to date (1903–1911, Teubner, Leipzig).

J. W. H. W.

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